INDICATIVE PROJECT SUMMARIES

SECTION 319 NONPOINT SOURCE COMPETITIVE GRANTS PROGRAM

FFY 1999 - 2003

Massachusetts Department of Environmental Protection
Bureau of Resource Protection
Cynthia Giles, Assistant Commissioner

2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NONPOINT SOURCE PROGRAM
INDICATIVE PROJECT SUMMARIES

FFY 1999 – 2003

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2003

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TABLE OF CONTENTS

Indicative Project Summaries - FFY 2002:

Indicative Project Summaries - FFY 2003:

Indicative Summaries by Basin, FFY 1999 - 2003

Blackstone

Boston Harbor

INTRODUCTION

This report presents indicative summaries of the projects partially financed by the Section 319 Massachusetts Nonpoint Source Competitive Grants Program during federal fiscal years (FFY) 1999 through 2003. Projects funded from the inception of the program in 1990 through 1998 are listed in the Appendix at the end of this report.

Congress annually appropriates funds under Section 319 (319) of the Clean Water Act of 1987 (33 U.S.C.A., Sc. 1251 et. seq.) to assist states in implementing their approved nonpoint source (NPS) programs. Section 319 is administered by the U.S. Environmental Protection Agency (EPA), which oversees the awards to individual states. The Massachusetts Department of Environmental Protection (Department), Bureau of Resource Protection, administers this award as part of the Massachusetts Nonpoint Source Program.

The 319 program focuses on the implementation of activities and projects for the control of nonpoint source pollution. EPA defines NPS pollution as that which is "caused by diffuse sources that are not regulated as point sources and are normally associated with precipitation and runoff from the land or percolation." The awards are intended to provide financial support for the state's programs for controlling the major statewide categories of NPS pollution or for protecting or improving NPS-impaired or threatened targeted water resources.

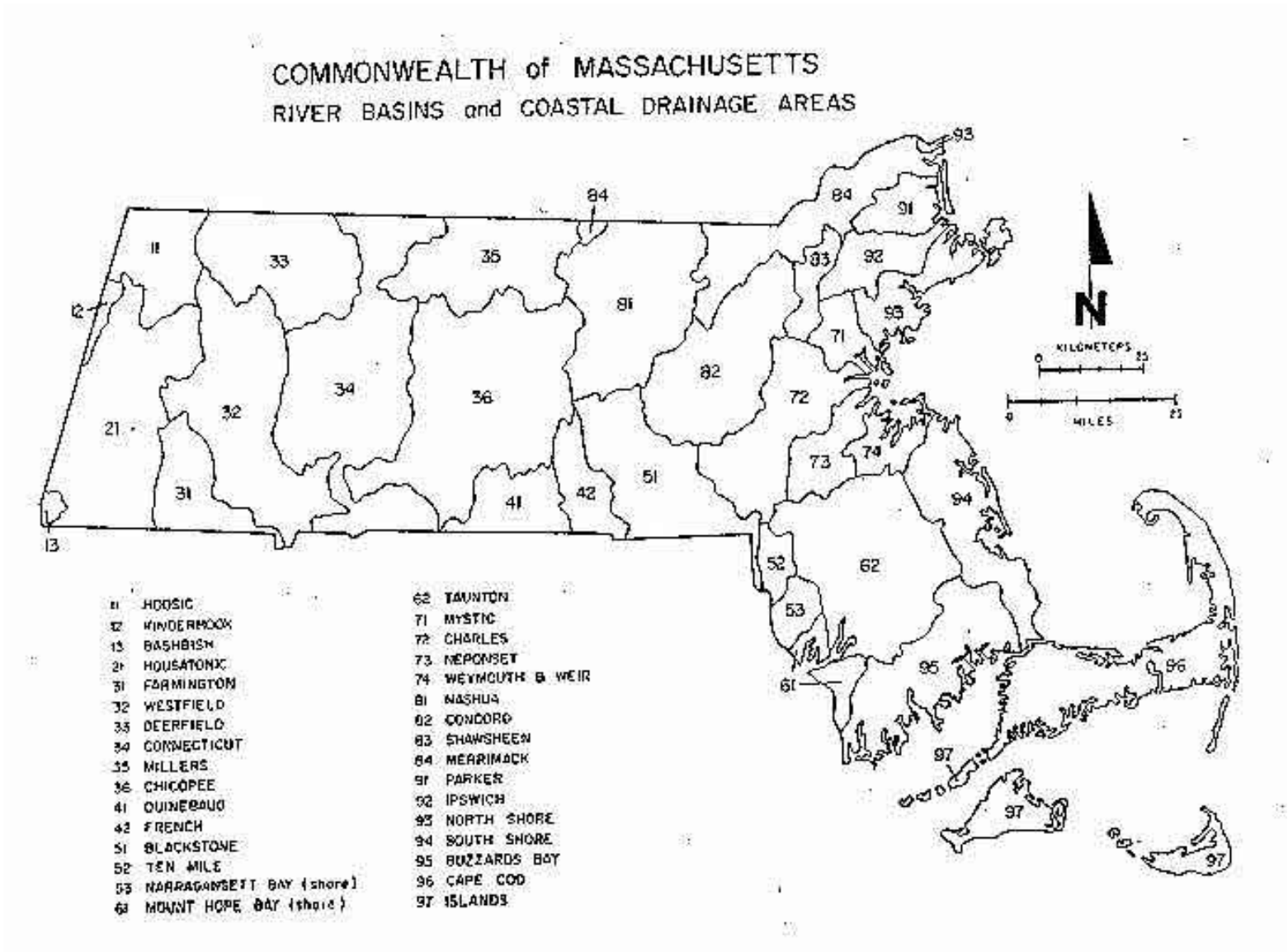
Each year, a portion of the 319 funds awarded to a state is used for specific watershed implementation projects that improve or protect threatened or impaired priority freshwater and coastal waters. Projects funded under this program must implement measures that address the prevention, control, and abatement of NPS pollution, and must result in restoration of beneficial uses or achieving or maintaining state water quality standards. A Request for Responses for competitive projects is issued by the Massachusetts Department of Environmental Protection in late winter. Proposals may be submitted by any interested Massachusetts public or private organization. The Department encourages all types of eligible, competitive proposals from all watersheds.

Since FFY ’01, the Department has particularly encouraged proposals that will begin implementation of Massachusetts’s Total Maximum Daily Load (TMDL) analyses, or that implement recommendations made in Diagnostic/Feasibility (D/F) or other studies for waters that do not meet Water Quality Standards. The Department also continues to encourage applicants to propose projects that support the Department’s ongoing basin-wide water quality activities. The Massachusetts Nonpoint Source Management Plan, which was updated in 2001, now includes Section IV, Nonpoint Source Action Strategies, a primary source of information for identification of comprehensive, 319-eligible projects that will lead to water quality improvement. The Nonpoint Source Action Strategies are compiled in table format to show the Category 5/303(d) impairments, other outstanding water quality issues, data/information sources, and recommendations that address the water quality impairments for each of the 27 major watersheds.

An internal screening committee reviews all eligible 319 proposals. Projects selected by the Department for funding are included in the Department's yearly program plan, which is submitted to EPA prior to the start of the federal fiscal year. Once the program plan has been approved, the Department enters into a contractual agreement with the proposal proponent to conduct the project.

A 40% non-federal match is required from the grantee. This match may be cash or from in-kind services performed as part of the approved project activities. Unless specifically recommended in a TMDL, research, program development, assessment, planning, and water quality monitoring for assessment purposes are not considered implementation activities and are not eligible for 319 funding or match credit. The typical project timeline is for three years. A Quality Assurance Project Plan and an Operation and Maintenance Plan are required for each implementation project.

The Massachusetts river basins used in watershed planning are illustrated in Figure 1. Table 1 shows a comparison between the total number of projects funded through the 319 program in each basin, and the total projects costs in each basin since the inception of the program in 1990.


COMMONWEALTH of MASSACHUSETTS
RIVER BASINS and COASTAL DRAINAGE AREAS
N
KILOMETERS
MILES
11 HOOSIC
12 HINDERMOOK
13 BASHBISH
21 HOUSATONIC
31 FARMINGTON
32 WESTFIELD
33 DEERFIELD
34 CONNECTICUT
35 MILLERS
36 CHICOPEE
41 QUINEBAUG
42 FRENCH
51 BLACKSTONE
52 TEN MILE
53 NARRAGANSETT BAY (shore)
61 MOUNT HOPE BAY (shore)
62 TAUNTON
71 MYSTIC
72 CHARLES
73 NEPONSET
74 WEYMOUTH & WEIR
81 NASHUA
82 CONCORD
83 SHAWSHEEN
84 MERRIMACK
91 PARKER
92 IPSWICH
93 NORTH SHORE
94 SOUTH SHORE
95 BUZZARDS BAY
96 CAPE COD
97 ISLANDS

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
Number of 319 Projects and Allocation of 319 Dollars by Basin (1990-2003)

Table I

Basin Name	Number of Projects	Dollars Allocated (match plus 319 funds)
Hudson (Hoosic, Kinderhook, BashBish)	0	0
Housatonic	9	$ 1,149,600
Deerfield	2	$ 62,500
Westfield	2	$ 21,4500
Farmington	4	$ 173,200
Connecticut	9	$ 1,490,300
Millers	1	$ 330,000
Chicopee	4	$ 460,000
Quinebaug	1	$ 86,700
French	0	0
Nashua	3	$ 205,000
Blackstone	7	$ 1,604,309
Merrimack	4	$ 412,700
Concord (SuAsCo)	7	$ 1,040,100
Shawsheen	0	0
Parker	1	$ 88,300
Ipswich	2	$ 460,000
North Coastal	3	$ 258,000
Boston Harbor (Mystic, Neponset, Weymouth & Weir)	7	$ 1,218,300
Charles	4	$ 469,200
South Coastal	7	$ 1,536,900
Cape Cod	13	$ 1,341,100
Islands	2	$ 218,600
Buzzards Bay	19	$ 2,560,800
Taunton	3	$ 146,800
Narragansett Bay & Mount Hope Bay	0	0
Ten Mile	1	$ 260,800
Statewide	33	$ 2,949,700

Notes:

- Where projects encompass more than one basin, the grant allocation has been divided evenly among basins.
- Dollar amounts shown are total project costs and include 40% non-federal matching funds.
- All dollar amounts are rounded to the nearest $100.

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 98-07/319

PROJECT TITLE: Reducing Stormwater Pollution in an Ultra-Urban Watershed
NPS CATEGORY: Urban Runoff
INVESTIGATOR: City of Somerville, Department of Public Works
LOCATION: Boston Harbor Coastal Drainage Area (Mystic River Basin)

DESCRIPTION:

The overall objective of this project is to improve the water quality of Alewife Brook by treating and reducing pollutant-laden stormwater discharges. Modeling done by the MWRA has predicted that, even with the elimination of the CSOs, Alewife Brook will not meet Class B water quality standards due to contamination from stormwater discharges. The project will install a stormwater BMP to address stormwater pollutants entering the Brook at Dilboy Field Parking Lot. Pollutants of concern include fecal coliform, *enterococcus*, and TSS.

Tasks to be completed under this project include:

1. Development of a Quality Assurance Project Plan (QAPP) and pre- and post-implementation monitoring of Alewife Brook to measure the effectiveness of the BMPs;

2. Design and installation of a Stormwater Treatment System in accordance with conceptual plans;

3. Development and implementation of an Operation and Maintenance plan to ensure continued functioning of the BMP; and

4. Development and distribution of a brochure and PowerPoint presentation to inform other municipalities and stakeholders about the project.

PROJECT COST: $119,833

FUNDING: $71,900 by the U.S. Environmental Protection Agency
$47,933 by the City of Somerville

DURATION: 2002-2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-01/319

PROJECT TITLE: Alternative Septic System Test Center Project Monitoring
NPS CATEGORY: Demonstration Project/Groundwater
INVESTIGATOR: Buzzards Bay Project
LOCATION: Buzzards Bay Watershed/Statewide

DESCRIPTION:

For 12 months, this project will concurrently monitor contaminant removal by twenty-one wastewater systems at the Alternative Septic System Test Center at the Massachusetts Military Reservation. The monitoring will produce a scientifically valid body of data which will be disseminated to state regulators, local boards of health, installers, and consumers through trade shows, newspaper articles, site visits, and through Website coverage.

Project goals are to: provide verified, comparable data for regulatory decision making; speed approval of technologies which have advanced contaminant removal, particularly nitrogen; and increase the variety of alternative systems approved to provide greater siting flexibility and thus reduce the cost to consumers and benefit the environment.

Tasks to be completed under this project include:

1. Monitor six alternative and one conventional onsite wastewater technologies in triplicate for BOD, fecal coliform, TSS, ammonium, nitrate+nitrite, total dissolved nitrogen, particulate nitrogen and carbon, orthophosphate, and total phosphorus. Monitoring will be done in accordance with an EPA-approved sampling protocol.

2. Conduct outreach to disseminate monitoring program results through:
    - at least one NE Onsite Wastewater Trade Show co-sponsored by the BBP;
    - publication of two articles about the Test Center in local newspapers and journals such as *Small Flows* and *Environment Cape Cod*;
    - posting information about the Test Center on the BBP website including description of the facility, goals, testing procedures, notices of facility tours and trade shows; and
    - a report on the types, uses and performance characteristics of the conventional and alternative systems monitored during this project.

PROJECT COST: $187,738

FUNDING: $112,643 by the US Environmental Protection Agency
$ 50,000 by the Massachusetts Environmental Trust
$ 16,095 by the Barnstable County Health and Environment Department
$ 9,000 by the Center for Marine Science and Technology

DURATION: 1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-03/319

PROJECT TITLE: Pontoosuc Lake Watershed Resource Restoration Project
NPS CATEGORY: Watershed Restoration Project
INVESTIGATOR: Berkshire Regional Planning Commission
LOCATION: Housatonic Watershed

DESCRIPTION:

Initial results of a comprehensive Diagnostic/Feasibility Study for Pontoosuc Lake in Pittsfield and Lanesborough indicate that stormwater runoff contains high levels of phosphorus that is exacerbating weed and algae infestations, and that nutrient loading from near-lake sources (residences, businesses, roadways, etc.) is a greater problem than agricultural runoff in the tributaries. This project will improve water quality in Pontoosuc Lake by beginning implementation of the recommendations of the D/F Study. Specifically, the project will correct priority storm drain problems at three stormwater outfalls in the northern cove of the lake by capturing the "first flush" of storm runoff and infiltrating it into the ground. The project will also include work with municipalities to begin a comprehensive program of source controls. Finally, directed outreach efforts will increase the awareness and environmental responsibility of all lake stakeholders.

Tasks to be completed under this project include:

1. Design and install innovative stormwater infiltration technologies at three sites on the northern cove of Pontoosuc Lake in Lanesborough;

2. Conduct volunteer monitoring of stormwater including rainfall volume, storm drain discharge, solids, conductivity, and nutrient levels according to an EPA-approved sampling protocol. Monitoring will be conducted before and after installation of the stormwater infiltration technologies;

3. BRPC will work with Pittsfield, Lanesborough and the County Commissioners to implement a comprehensive program of source controls including septic management, road maintenance, and weed harvesting on Pontoosuc Lake; and

4. BRPC will organize and present a workshop for lakeshore businesses to encourage property management efforts that protect the lake including plant material buffer strips, pervious paving materials, and other practices to reduce runoff from parking areas.

PROJECT COST: $121,995

FUNDING:
$ 71,450 by US EPA
$ 21,470 by City of Pittsfield
$ 2,075 by Berkshire County Commissioners
$ 7,000 by Housatonic Valley Association
$ 20,000 by Town of Lanesborough

DURATION: 1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-04/319

PROJECT TITLE: Winsegansett Salt Marsh Restoration Project
NPS CATEGORY: Demonstration/Watershed Restoration Project
INVESTIGATOR: Town of Fairhaven
LOCATION: Buzzards Bay Watershed

DESCRIPTION:

The project will demonstrate restoration of the Winsegansett Salt Marsh, a 30-acre coastal wetland on the western shore of Buzzards Bay. A culvert beneath Winsegansett Avenue will be replaced with a larger box culvert. The restoration of natural tidal flow will increase salinity in the marsh and eliminate an existing stand of *Phragmites*. The end objective is to permit natural recolonization of S*partina* plant communities in the upper reaches of Winsegansett Marsh, thereby improving juvenile finfish and shellfish habitat and supporting the feeding habitats of local wildlife species, including the federally listed endangered Roseate Tern and Osprey.

The project also includes publication and distribution of the "Atlas of Tidally Restricted Salt Marshes in Buzzards Bay" which can be used to target other salt marshes in need of similar restoration efforts.

Tasks to be completed under this project include:

1. Design and installation of the box culvert at Winsegansett Avenue;

2. Monitoring of pre- and post-construction water quality in accordance with an EPA-approved sampling protocol, and pre- and post-construction GIS mapping of the extent of salt marsh vegetation in Winsegansett Salt Marsh; and

3. Printing and distribution of the "Atlas of Tidally Restricted Salt Marshes" to coastal communities in Buzzards Bay.

PROJECT COST: $ 42,400

FUNDING: $ 22,500 by the US Environmental Protection Agency
$ 19,900 by the Town of Fairhaven

DURATION: 1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-05/319

PROJECT TITLE: Telecom City: Malden, Medford, Everett
NPS CATEGORY: Demonstration/Watershed Restoration Project
INVESTIGATOR: Mystic Valley Development Commission
LOCATION: Boston Harbor (Mystic) Watershed

DESCRIPTION:

The project is part of a larger effort to redevelop a 200+ acre brownfield site along the Malden River where the cities of Malden, Medford and Everett meet. The focus of this project is to mitigate stormwater impacts to banks, buffers, and surface water quality within the Malden River Corridor by implementing stormwater BMPs, and to develop data on the effectiveness of those BMPs at a difficult urban redevelopment site. The proponent's goal is to put the "environmental portion" of the larger redevelopment project, such as public recreational open space, stormwater controls and wetlands rehabilitation, in place before the proposed industrial redevelopment of the site begins and overrides environmental concerns.

Tasks to be completed under this project include:

1. Monitoring in accordance with an EPA-approved sampling protocol to establish pre-construction parameters for NPS runoff quality, local hydrology and subsurface geology;

2. Development of a model to quantify the predicted mitigation of NPS runoff impacts through BMP implementation;

3. Design and implementation of stormwater BMPs and restoration of wetlands and wildlife habitat prior to commencement of the industrial redevelopment of the larger brownfields site;

4. Six months of monitoring the BMPs operations and efficiency, and monitoring NPS runoff and surface water quality in accordance with an EPA-approved sampling protocol;

5. Final calibration of the predictive model based on post-construction monitoring results; and

6. Development of an outreach programs for the three host communities and outreach documenting the effectiveness of the BMPs implemented at an urban redevelopment site.

PROJECT COST: $250,000

FUNDING: $150,000 by the US Environmental Protection Agency
$100,000 by the Mystic Valley Development Commission

DURATION: 1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-06/319

PROJECT TITLE:	Development of a Rational Basis for Designing Recharging Stormwater Control Structures and Flow and Volume Design Criteria
NPS CATEGORY:	Demonstration/Technical Assistance Project
INVESTIGATOR:	UMass/Amherst
LOCATION:	Statewide

DESCRIPTION:

The Massachusetts Stormwater Standards Guidance recommends that 80% of total suspended solids (TSS) be removed from the first 0.5 inches of rainfall. The intensity of the rain event that produces this 0.5 inches will influence both the amount and quality of the TSS. A high intensity storm will produce high TSS with large and small grain sizes. A small intensity storm may have lower TSS but finer grained materials. The typical design standard for infiltration devices is based on flow rate rather than TSS removal rates. Therefore, the relationship between storm characteristics and infiltration device design needs to be clarified in order for the Standards to be applied by regulators.

The project will include a literature review and development of a numerical model of infiltration of stormwater through infiltration structures and the underlying soils. Inputs to the model will include hydraulic conductivity of all relevant porous media, the area of the infiltration structure, the volume of water to be infiltrated and local groundwater conditions. The output of the model will be the time required to complete infiltration. The model and its results can then be used to design and site infiltration structures to implement the Massachusetts stormwater management standards.

Tasks to be completed under this project include:

1. Literature review and conceptualization of the numerical model;
2. Model development, debugging and parameter investigation;
3. Preliminary and full model runs; and
4. Data analysis and report preparation.

PROJECT COST:	$ 53,943
FUNDING:	$ 32,135 by the US Environmental Protection Agency $ 21,808 by the University of Massachusetts
DURATION:	1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-07/319

PROJECT TITLE: Design and Guidance for Shallow Trench Low Pressure Pipe Distribution Systems for the Massachusetts Title 5 Innovative/Alternative Septic System Program
NPS CATEGORY: Technical Assistance Project
INVESTIGATOR: UMass/Amherst
LOCATION: Statewide

DESCRIPTION:

The project will provide performance data and design criteria for Shallow Trench Low Pressure Distribution Systems (STLPPs) and develop a Design Guidance Manual for the systems. STLPPs are a non-patentable alternative technology for wastewater disposal that have been in widespread use outside of Massachusetts over the past 10 years. If performance of the systems proves to be acceptable, the data developed and the Design Guidance Manual can be used to draft approval letters for General and Remedial Use Certification by DEP under CMR 310 15.288(2) and STLPPs can become part of the Title 5 Innovative/Alternative Technologies Program.

Tasks to be completed under this project include:

1. Review and compilation of available performance and design data for STLPPs;

2. Outline and preparation of the Design Guidance Manual;

3. Review of the draft manual by 10 outside reviewers (DEP, Boards of Health or their agents, engineers and sanitarians);

4. Completion of the Design Guidance Manual; and

5. Distribution and presentation of the Manual to DEP staff and all Massachusetts Boards of Health through free mailing and workshop presentations.

PROJECT COST: $ 43,089

FUNDING: $ 25,402 by the US Environmental Protection Agency
$ 177,687 by the University of Massachusetts

DURATION: 1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-08/319

PROJECT TITLE: Mill River Watershed Restoration Project
NPS CATEGORY: Watershed Restoration Project
INVESTIGATOR: Franklin Regional Council of Governments
LOCATION: Connecticut Watershed

DESCRIPTION:

This project will permanently stabilize portions of the Mill River riverbank using soil bioengineering techniques. This will prevent erosion that currently threatens the Whately Water Department's water supply well and a monitoring well, and will preserve the values of the natural stable stream form. Because of the difficulties associated with siting and developing any water supply source, and the lack of a clear alternative site for the Whately Water Department, relocating the wells would be difficult. In addition, a cut through the meander bend at this location may establish a pattern of instability that will spread upstream as a "head cut" resulting from the change in gradient brought about by the channel shortening. Repair of the bank will not only protect a critical drinking water supply, but it will also prevent what is now a localized instability from spreading through the watershed.

Tasks to be completed under this project include:

1. Develop a request for proposals to design, permit and construct appropriate soil bioengineering bank reconstruction on the eroded streambank;

2. Construct the soil bioengineering bank stabilization features;

3. Inspect the streambank annually for vegetation viability and project stability according to standard protocols approved by DEP; and

4. Conduct a technology transfer workshop organized jointly by the FRCOG and the Whately Water Department, with handout and presentation materials prepared by both parties.

PROJECT COST: $ 62,875

FUNDING: $ 37,600 by the US Environmental Protection Agency
$ 25,275 by the Town of Whately

DURATION: 1999 - 2001

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-09/319

PROJECT TITLE:	Demonstration of Best Management Practices to Control Agricultural Nonpoint Source Pollution
NPS CATEGORY:	Agriculture
INVESTIGATOR:	Massachusetts Department of Food and Agriculture
LOCATION:	Statewide

DESCRIPTION:

This project will demonstrate how successful implementation of Best Management Practices (BMPs) and farm plans by farmers in targeted watersheds can prevent, control and abate the generation of agricultural nonpoint source pollution.

Specific tasks to be performed included:

1. Administer an agricultural nonpoint source pollution control program;

2. Provide farmers with the knowledge and technical assistance necessary to identify nonpoint source generating activities; and

3. Provide technical assistance to farmers to voluntarily implement BMPs.

COST:	$100,963
FUNDING:	$ 62,238 by the US Environmental Protection Agency $ 38,725 by the Massachusetts Department of Food and Agriculture
DURATION:	1999-2000

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 99-11/319

PROJECT TITLE: Innovative Stormwater Technology Monitoring Initiative
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Massachusetts Department of Environmental Protection and Office of Coastal Zone Management
LOCATION: Statewide Massachusetts

DESCRIPTION:

This project will develop and implement a comprehensive monitoring program to evaluate specific installations of innovative stormwater BMPs. Results and information obtained through the monitoring initiative will be used to develop informational outreach materials for public dissemination and to inform municipal officials and others about BMP selection and application.

Tasks include:

1. Convene Innovative Stormwater Technology (IST) working group;

2. Identify innovative BMP technologies and specific installations for inclusion in the initiative and obtain construction certifications from proprietary technology vendor;

3. Develop a Quality Assurance Project Plan (QAPP) and QA/QC criteria and protocols for each application. For each technology and installation a QAPP will be developed and submitted to US EPA for approval. Technical protocols, currently being developed by the STEP program, Guidance for Quality Assurance Project Plans currently being developed by the MA DEP Massachusetts Watershed Initiative Program, and an existing US EPA approved QAPP for an ongoing proprietary stormwater technology BMP monitoring initiative, will be utilized to facilitate and expedite protocol development;

4. Initiate and conduct water quality sample collection and analysis;

5. Develop and distribute IST catalogue. Results and information obtained from this monitoring initiative will be developed into a user-friendly informational catalogue for distribution. Catalogue recipients will be Conservation Commissions, department of Public Works Staff, Local and Regional Planners, Local and Governance Committees. This catalogue will be provided to the Massachusetts Bays Program (MBP) and the Natural Resource Conservation Service (NRCS) Massachusetts Community Assistance Partnership (MassCAP) for informational outreach material. Informational materials from the IST catalogue will be utilized to develop an IST informational web page with links to MA DEP, MCZM, STEP and MBP home pages; and

6. Prepare final report evaluating each technology assessed.

PROJECT COST: $195,000

FUNDING: $110,000 by the U.S. Environmental Protection Agency
$ 85,000 by the Office of Coastal Zone Management

DURATION: 2000-2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-01/319

PROJECT TITLE: Implementing the Diagnostic/Feasibility Study Recommendations for Onota Lake
NPS CATEGORY: Watershed Restoration
INVESTIGATOR: Berkshire Regional Planning Commission
LOCATION: Housatonic Watershed

DESCRIPTION:

This project will implement in-lake and watershed management techniques recommended in a comprehensive Diagnostic/Feasibility Study prepared by International Technology Corporation for Onota Lake. This comprehensive approach will reduce the immediate impacts from accelerated eutrophication as well as control the causes of that eutrophication. The project builds upon prior implementation activities and demonstrates the strong support and commitment the City of Pittsfield has made to improving water quality in this important recreational water body.

The overall goal of abating the accelerated eutrophication of Onota Lake will be accomplished through the continued implementation of in-lake restoration and watershed management measures to reduce nutrient and sediment loading. Implementation of these measures will improve water quality, improve fish habitat, and improve recreational use of the lake.

To accomplish this goal, the following tasks recommended in the D/F Study will be completed under this project:

1. Short-circuit nutrient rich water entering the lake from north basin tributaries by installing a culvert under the Thomas Island causeway;

2. Evaluate long-term changes in water quality in the lake as well as measuring pre- and post-installation impacts of the bridge culvert installation through a volunteer monitoring program;

3. Decrease the density and distribution of aquatic weeds through a comprehensive weed control program;

4. Decrease the contribution of stormwater-related pollutants and sediments through stormwater retention/detention basins;

5. Reduce soil transport and subsequent lake filling from existing erosion sties, including erosion sites in Burbank park, through an erosion control program; and

6. Prevent and reduce nutrient inputs into the lake through a public education/involvement/outreach program.

PROJECT COST: $283,900

FUNDING: $167,000 by the US Environmental Protection Agency
$ 6,000 by the Berkshire Regional Planning Commission
$104,950 by the City of Pittsfield
$ 5,950 by the Lake Onota Preservation Association

DURATION: 2000 - 2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-02/319

PROJECT TITLE: Alternative Septic System Test Center Project Monitoring II
NPS CATEGORY: Demonstration Project/Groundwater
INVESTIGATOR: CZM Buzzards Bay Project
LOCATION: Buzzards Bay Watershed/Statewide

DESCRIPTION:

This project will continue the monitoring of contaminant removal by twenty-one wastewater systems at the Alternative Septic System Test Center at the Massachusetts Military Reservation, first undertaken in project 99-01/319. The monitoring will produce a scientifically valid body of data which will be disseminated to state regulators, local boards of health, installers and consumers through trade shows, newspaper articles, site visits, and through Website coverage.

Project goals continue to be to: provide verified, comparable data for regulatory decision making; speed approval of technologies which have advanced contaminant removal, particularly nitrogen; increase the variety of alternative systems approved to provide greater siting flexibility and thus reduce the cost to consumers and benefit the environment; and provide needed baseline data about the conventional system's contaminant removal capabilities.

Tasks to be completed under this project include:

1. Monitor six alternative and one conventional onsite wastewater technologies in triplicate for BOD, fecal coliform, TSS ammonium nitrate+nitrite, total dissolved nitrogen, particulate nitrogen and carbon, orthophosphate and total phosphorus. Monitoring will be done in accordance with an EPA-approved sampling protocol.

2. Conduct outreach to disseminate monitoring program results through:
    - at least one NE Onsite Wastewater Trade Show co-sponsored by the BBP;
    - two onsite information tours of the test facility for local, state and regional regulators;
    - publication of two articles about the Test Center in local newspapers and journals such as *Small Flows* and *Environment Cape Cod*;
    - posting information about the Test Center on the BBP website including description of the facility, goals, testing procedures, notices of facility tours and trade shows; and
    - a report on the types, uses and performance characteristics of the conventional and alternative systems monitored during this project.

PROJECT COST: $190,500

FUNDING: $112,500 by the US Environmental Protection Agency
$ 41,400 by the Massachusetts Environmental Trust
$ 7,200 by the Barnstable County Health and Environment Department
$ 11,000 by the Center for Marine Science and Technology
$ 4,800 by the Cape Cod Community College
$ 5,000 by technology vendors

DURATION: 2000 - 2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-03/319

PROJECT TITLE:	Development of a Rapid Field Test for the Quality of Stone Aggregate in Onsite Septic Systems
NPS CATEGORY:	Demonstration Project/Groundwater
INVESTIGATOR:	Barnstable County Department of Health and the Environment
LOCATION:	Buzzards Bay Watershed/Statewide

DESCRIPTION:

This project will develop and/or validate a simple field test for quality of stone aggregate used in the soil absorption portions of onsite septic systems. The overall goal is to encourage the production of better quality aggregate. Involvement of both industry and regulatory entities at critical points in the research will help ensure useful results.

Project goals are:

- To promote the use of aggregate that will maximize the life of soil absorption systems and meet the intent of Title 5 to prevent the intrusion of fine-textured material at the system-soil interface;
- To determine the validity of the various simple field tests (i.e., the bucket test) in predicting the level of fine-textured material in aggregate samples;
- To correlate the findings of simple field tests with the actual level of impairment to the leaching facility imparted by the level of fines observed;
- To refine the test for aggregate such that the result will indicate an appropriate level of "clean" that is neither too restrictive/cost prohibitive, nor too lenient as to decrease the life of a leaching facility;
- To produce a guidance document that will describe the appropriate methodology for testing aggregate in the field and to provide training workshops for its use.

Tasks to be completed under this project include:

1. Research all existing rapid tests for the quality of stone aggregate used in onsite septic system leachfields;
2. Develop a methodology for testing the quality of aggregate. In this context, aggregate testing means actually testing/observing what effect the aggregate quality has on the percolation rate of the soil it is installed in;
3. Construct scaled-down leachfields that can be loaded with liquid effluent at a rate comparable to the of Title 5 in order to conduct full-scale tests of stone aggregate quality;
4. Conduct tests on 30-40 loads of aggregate, including all appropriate rapid field tests and actual full-scale tests so that the results of the rapid field test and full-scale tests can be correlated and the most useful and accurate field tests can be identified; and
5. Conduct at least six workshops demonstrating the most appropriate methods for testing aggregate in the field.

PROJECT COST:	$ 28,500
FUNDING:	$ 17,000 by the US Environmental Protection Agency $ 11,500 by the Barnstable County Health and Environment Department
DURATION:	2000 - 2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-04/319

PROJECT TITLE: Connecticut River Watershed Restoration - Phase II
NPS CATEGORY: Watershed Restoration/Demonstration Project
INVESTIGATOR: Franklin Regional Council of Governments
LOCATION: Connecticut Watershed

DESCRIPTION:

The project will continue bioengineering streambank stabilization begun as an earlier 319 project (Connecticut River Watershed Restoration 96-03/319). Streambank stabilization will be done at the Turners Falls Power Pool, extending from Turners Falls to the Vermont/New Hampshire border, which is experiencing severe erosion. The severe erosion is increasing nonpoint source pollution in an important anadromous and freshwater fisheries habitat, and is causing the loss of prime agricultural land and the loss of woody riparian buffer habitat used by migratory birds, eagles and other wildlife. Bioengineering techniques using native vegetation and natural materials to stabilize the eroding sites will be employed. The project will also include continued monitoring of the previously completed stabilization project funded through the 319 program under Project 96-03/319.

The project goals are to build on the success of the previous Connecticut River bioengineering projects in restoring and stabilizing severely eroding streambanks, and to demonstrate the effectiveness of "soft" bioengineering as an alternative to riprap and conventional shoreline armoring.

Tasks to be completed under this project include:

1. Repairing approximately 1000 linear feet of eroded streambank using bioengineering techniques. This will include site selection, design preparation, permitting, selection of contractor, and supervision of design construction and installation;

2. Developing an EPA-approved Quality Assurance Project Plan for monitoring of the bioengineered sites;

3. Monitoring the sites from pre-construction through evaluation of the project's initial and long-term success, and for continued maintenance. Monitoring will be conducted at least on a quarterly basis following installation; and

4. Technology transfer for resource and regulatory professionals who may be interested in applying similar techniques at other locations. Outreach will include site tours, a poster session at the MACC annual meeting, creation of a website describing the use of bioengineering for streambank restoration and informational materials including a cost analysis and written project summary.

PROJECT COST: $480,716

FUNDING: $178,971 by the US Environmental Protection Agency
$ 10,745 by the Franklin Regional Council of Governments
$291,000 by the Western Massachusetts Electric Company

DURATION: 2000 - 2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-05/319

PROJECT TITLE: Atlas of Stormwater Discharges
NPS CATEGORY: Stormwater/Technical Assistance
INVESTIGATOR: CZM Buzzards Bay Project
LOCATION: Buzzards Bay Watershed

DESCRIPTION:

This project will prepare, print and disseminate a "user friendly" *Atlas of Stormwater Discharges* for the Buzzards Bay. The *Atlas* will then be used for an outreach program designed to assist Buzzards Bay communities in preparing grant application to the DEP 319 and MCZM CPR grant programs to mitigate stormwater discharges into the Bay. The completed *Atlas* will provide communities and EOEA Watershed Teams with a valuable tool for determining where stormwater mitigation projects will provide the "most bang for the buck".

The project is an important first step in implementing the Buzzards Bay Comprehensive Conservation and Management Plan (CCMP), one of the first comprehensive watershed management plans to be completed in the Commonwealth. One of the priority management issues identified in the CCMP is control and remediation of stormwater discharges impacting the water quality of Buzzards Bay. Investigations by the Buzzards Bay Project and Division of Marine Fisheries have identified stormwater runoff as the primary factor in most of the Bay's shellfish bed closures. Today, more than 10,000 acres of shellfish beds in Buzzards Bay are closed to harvest due to elevated levels of fecal coliform bacteria with a subsequent loss of economic opportunity to coastal communities. Due to the unique nature of the Buzzards Bay coastline, restoration of Bay water quality is highly dependent on localized remediation of stormwater runoff.

Tasks to be completed under this project include:

1. Compile available water quality data for Buzzards Bay;

2. Complete and distribute the *Atlas of Stormwater Discharges* on paper and in digital form to local DPWs, Conservation Commissions, Boards of Health, Planning Boards, Regional Planning Agencies, advocacy groups, watershed organizations, and state and federal transportation agencies;

3. Use the *Atlas* to identify areas in need of additional water quality monitoring; and

4. Use the *Atlas* to assist local communities and other organizations to identify priority sites for stormwater remediation.

PROJECT COST: $41,000

FUNDING: $25,000 by the US Environmental Protection Agency
$16,000 by the Massachusetts Environmental Trust

DURATION: 2000 - 2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-06/319

PROJECT TITLE:	Management Strategies for Massachusetts Dairy Farms to Reduce the Risk of Nonpoint Source Pollution
NPS CATEGORY:	Technical Assistance
INVESTIGATOR:	University of Massachusetts/Amherst
LOCATION:	Blackstone, Buzzards Bay, Chicopee, Connecticut, Deerfield, Farmington, Hoosic, Housatonic, Ipswich, Merrimack, Nashua, North Coastal, South Coastal, Taunton and Westfield Watersheds

DESCRIPTION:

The crop, dairy and livestock industries are important contributors to the Massachusetts economy through the services and industries they support. The 1997 New England Agricultural Statistics reported that in 1996 the value of animal output was $107 million, with more than $70 million attributable to the dairy industry. Dairy and livestock farmers also contribute to maintaining open space in the Commonwealth by managing 134,000 acres of hay, pasture, and silage. This open space is important to both non-farm residents and tourism. However, on a typical dairy farm there is often an over-supply of farm nutrients on cropland, particularly nitrogen (N), together with phosphorus and potassium, from excess application of dairy manure and from crop residues and commercial fertilizer. This creates a significant nonpoint source pollution risk for both ground and surface waters.

This project's goal is to reduce the risk of nonpoint source pollution from dairy farms through development of nutrient management plans for 15-25 dairy farms each year and through the voluntary adoption of those BMPs by farmers. The project will establish an inter-agency advisory committee, conduct educational workshops and meetings, produce educational tools and materials, conduct on-farms demonstrations and educational programs, and provide technical assistance to farmers wishing to implement nutrient management plans.

Tasks to be completed under this project include:

1. Establish an Inter-agency Advisory committee to advise and assist in project design, agency and farmer involvement, management recommendations, data collection, and program implementation;

2. Conduct one to two educational workshops each year providing information on soil basics, manure management, whole-farm nutrient planning, and best management practices for nutrients, pesticides and biosecurity;

3. Develop worksheets, computer programs and educational materials for nutrient management planning;

4. Develop customized nutrient management plans for 15 to 25 farms each year and implement the recommended BMPs; and

5. Implement on-farm demonstration and educational programs for farmers.

PROJECT COST:	$250,718
FUNDING:	$149,431 by the US Environmental Protection Agency $101,287 by the University of Massachusetts/Amherst
DURATION:	2000 - 2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-07/319

PROJECT TITLE: Town of Acton Nonpoint Source Control Program
NPS CATEGORY: Subwatershed/Demonstration Project
INVESTIGATOR: Town of Acton
LOCATION: SuAsCo Watershed

DESCRIPTION: This project will address two separate issues in the Town of Acton.

The Town of Acton must implement a Watershed Trading Program, developed in 1998, in order to be considered for an EPA NPDES permit to discharge treated wastewater effluent to the Assabet River. EPA has set a goal of 3:1 for this project, meaning that for every pound of phosphorous discharged into the river from the treatment plant, 3 pounds must be prevented from entering the waterway via nonpoint sources. Acton's Watershed Trading Program recommends both structural and non-structural stormwater BMPs in order to achieve the necessary reductions in phosphorous loading. The project will provide a valuable test case for trading programs that are being promoted as one means available to communities to meet the requirements of the Phase II Stormwater NPDES Program that will become effective over the next few years.

The first portion of the project will implement stormwater BMPs to demonstrate that phosphorous reduction can be achieved to the level required under the trading program. It is not anticipated that this project alone will achieve all required reductions; rather, that evidence will be provided to satisfy the Town and EPA that the goal can be achieved. Full implementation of the trading program would then follow over the next few years.

The second portion of the project will also focus on mitigation of phosphorus in surface waters. The Town's newly created 9-acre public swimming pond has relatively high background phosphorous concentrations. The Town will construct a pond/wetland recirculation system that will be used to reduce background phosphorus levels in the pond in an effort to prevent phosphorous levels from reaching a point that would support the growth of nuisance levels of algae and macrophytes in the pond.

Tasks to be completed as part of the BMP implementation portion of this project include:

1. Identification of specific sites where the Town has access and resources to install BMPs;
2. Sampling of stormwater runoff to establish pre-BMP water quality;
3. Construction of BMPs;
4. Sampling of stormwater runoff to establish post-BMP water quality; and
5. Documentation of the project's success and extrapolation to reach the wider Watershed Trading Program's goals.

Tasks to be completed as part of the pond recirculation portion of this project include:

1. Design and construction of the wetland recirculation system;
2. Design and construction of a handicap accessible trail and viewing area;
3. Completion of a demonstration project manual; and
4. Development and production of public education materials.

PROJECT COST: $177,740

FUNDING: $106,644 by the US Environmental Protection Agency
$ 71,096 by the Town of Acton

DURATION: 2000 - 2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-08/319

PROJECT TITLE: Long Pond Restoration Project, Littleton, MA
NPS CATEGORY: Watershed Restoration/Inlake
INVESTIGATOR: Town of Littleton
LOCATION: SuAsCo Watershed

DESCRIPTION:

Eutrophication of Long Pond has led to extremely dense macrophyte growth along the shoreline of the pond, with subsequent degradation of the recreational uses of the pond. Restoration of the recreational and aesthetic values of the pond are overall goals of this project. The water quality impacts of storm drains and septic systems are probably factors in the accelerating rate of eutrophication in the pond, and so will be targeted in this project along with implementation of inlake watershed restoration measures.

The project is a Phase II (implementation) project for the restoration of the pond. The goal is to restore water quality and recreational value of Long Pond through the implementation of a watershed management program identified in a 1990 Diagnostic/Feasibility Study. The recommended short-term elements of the program include removal of nuisance plants via macrophyte hydroraking and installation of bottom barriers in selected areas. Long-term recommendations include installation of a treatment system (detention basin) designed to reduce nutrient and suspended sediment inputs to Long Pond, a watershed maintenance program, and development of an educational program aimed at the abutters and users of Long Pond. The educational program will include information on the use and misuse of storm drains, septic system maintenance and upgrades, restrictions on lawn fertilization, protection of shoreline integrity, and disposal of organic material in waterways. Finally, the project will include development of regulations and water resource bylaws to control development on pre-existing undersized lots within the Long Pond watershed.

Tasks to be completed as part of this project include:

1. Develop a QAPP for pre- and post-construction water quality monitoring;
2. Conduct macrophyte hydroraking along the northeastern embayment;
3. Install benthic barriers at the deeper regions around the town beach to prevent encroachment by future macrophyte growth and keep the public swimming area intact;
4. Design and construct a stormwater detention basin/lagoon system; and
5. Conduct at least one educational workshop and distribute approximately 5,000 educational brochures to area residents on the concepts of sound “urban housekeeping” in the Long Pond watershed.

PROJECT COST: $313,000

FUNDING: $185,000 by the US Environmental Protection Agency
$128,000 by the Town of Littleton

DURATION: 2000 - 2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-09/319

PROJECT TITLE: Onset Bay, Wareham, MA, Nonpoint Source Pollution Remediation Project
NPS CATEGORY: Watershed Restoration
INVESTIGATOR: Town of Wareham
LOCATION: Buzzards Bay Watershed

DESCRIPTION:

The northern portion of Onset Bay is closed to shellfishing from May 1st through November 1st, due in large part to fecal contamination associated with stormwater runoff. The 1989 report entitled *Sanitary Survey Report of Onset Bay in the Towns of Bourne and Wareham* identified fecal contamination as the principal contributing factor in shellfish area closures in the area. The Town of Wareham has made substantial investment to sewer the Onset and Point Independence areas and so has virtually eliminated failing or substandard septic systems as a source of fecal contamination to the Bay. The Town has also undertaken a comprehensive stormwater management program and has made significant progress in remediating stormwater discharges at several problem areas in town.

This project will address four stormwater outfalls that discharge directly into Onset Bay from South Boulevard and the Onset Town Pier. The project augments previous projects undertaken by the Town of Wareham to remediate stormwater impacts to local shellfish beds.

The goals of the project are to upgrade the seasonally closed shellfishing areas of Onset Bay and to mitigate the direct stormwater discharges located at public beaches along South Boulevard. Remediation efforts at the four stormwater discharges will concentrate on subsurface infiltration of the "first flush" or the first one-half inch of runoff from a precipitation event. Soil conditions at the sites are mapped as Carver coarse sands with water tables expected to be in excess of six to ten feet below grade. These soils are excellent for stormwater infiltration and will provide a high degree of treatment. Critical catch basin structures will also be upgraded to provide deep sumps, hoods and pipes to infiltration chambers.

All improvements will occur on town-owned land. Drainage structure improvement will typically occur within the roadway layout. The infiltration structures should be located outside the paved roadway on adjacent town-owned land.

Tasks to be completed as part of this project include:

1. Develop a QAPP for pre- and post-construction water quality monitoring;
2. Design and construct stormwater remediation BMPs for four stormwater outfalls;
3. Conduct pre- and post-construction water quality monitoring;
4. Conduct public outreach about the project through public hearings and local newspaper coverage; and
5. Conduct at least one educational workshop and distribute educational brochures to area residents on the concepts of sound "urban housekeeping" and the potential sources of fecal contamination to Onset Bay.

PROJECT COST: $218,000

FUNDING: $130,800 by the US Environmental Protection Agency
$ 87,200 by the Town of Wareham

DURATION: 2000 - 2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-10/319

PROJECT TITLE: Shaw's Plaza Drainage Nonpoint Source Pollution Management
NPS CATEGORY: Stormwater/Groundwater
INVESTIGATOR: Town of Sharon
LOCATION: Taunton Watershed

DESCRIPTION:

The project will develop and implement an NPS pollution management plan for the Shaw's Plaza parking lot drainage system, located in the Billing Brook subbasin in Sharon. The management plan is needed to control untreated, unfiltered contaminants from the parking lot that currently discharge directly into Billings Brook. The discharge is located ¼ mile from one of Sharon's public water supply wells, and within 1-½ miles of another of Sharon's public water supply wells and four public water supply wells for the Town of Foxboro. Water from the parking area has an impact on the water quality of Billing Brook, an impact on the health of the wetlands that recharge the six nearby public water supply wells, and perhaps on the quality of the drinking water from the municipal wells.

Due to the configuration of the parking lot site and ownership of the adjacent lands, it is difficult to treat the runoff using the traditional methods of above ground detention, settling and velocity reduction. Therefore, it is anticipated that in-ground stormwater treatment technologies will be used on the site.

Tasks to be completed as part of this project include:

1. Develop a methodology to determine and implement appropriate stormwater BMPs to control runoff from the Shaw's Plaza parking lot;
2. Construct a drainage system with all identified BMPs and including oil/gas separator type catch basins and infiltrators;
3. Develop a maintenance program designed to ensure continued proper functioning of the drainage system and BMPs; and
4. Initiate a public-education program on the concepts of sound "urban housekeeping" and potential impacts of NPS contaminants from roads and parking lots on downstream resources.

PROJECT COST: $48,500

FUNDING: $26,000 by the US Environmental Protection Agency
$22,500 by the Town of Sharon

DURATION: 2000 – 2002

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-12/319

PROJECT TITLE: Salisbury Pond Resource Restoration
NPS CATEGORY: Resource Restoration
INVESTIGATOR: City of Worcester Parks, Recreation and Cemetery Department
LOCATION: Blackstone River Watershed

DESCRIPTION:

Salisbury Pond is experiencing rapid filling due to sedimentation from upstream development and urban runoff. Several studies have been done on Salisbury Pond, including a 1987 D/F study and a 2000 MA DEP sediment investigation. A draft TMDL identified high phosphorus levels as the cause of high algal blooms and aquatic macrophytic vegetation. Contaminated sediment and high bacteria counts have also been problematic.

The project will design and install a structural BMP at the pond's main inlet to reduce phosphorus and sediment entering the pond. Two sediment chambers will be installed in upstream tributaries, with an anticipated 80% reduction in grit and oil. A steering committee will meet monthly to provide project oversight and facilitate public participation in the project.

Tasks to be completed under this project include:

1. Design, permitting and construction of structural best management practices at the main inlet to Salisbury Pond;

2. Design and construction of two underground sediment/contaminant removal systems in two subwatersheds, the Park Avenue outfall and the Weasel Brook subwatershed;

3. Maintenance of BMPs and sediment/contaminant removal systems;

4. Development and implementation of a DEP- and EPA-approved QAP; and

5. Outreach and education through storm drain stenciling and an educational kiosk.

PROJECT COST: $ 297,000

FUNDING:

$174,000 by the U.S. EPA	$ 5,000 by Tighe and Bond
$ 14,000 by Worcester Polytechnic Institute	$61,500 by the Worcester DPW
$ 1,000 by the Regional Environmental Council	$ 9,000 by the Norton Company
$ 8,000 by the Mill Brook Task Force	$ 1,000 by Frost Manufacturing
$15,000 by the Worcester Parks Department	$ 3,000 by the MA Dept. of Public Health
$ 4,000 by Massachusetts Audubon Society	

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-13/319

PROJECT TITLE:	Implementation of Nutrient Management Standards on Massachusetts Crop/Livestock Farms to Reduce the Risk of Nonpoint Source Pollution
NPS CATEGORY:	Agriculture
INVESTIGATOR:	UMass/Amherst
LOCATION:	Statewide

DESCRIPTION:

The goal of this project is to reduce the risk of nonpoint source pollution from crop/livestock farms through implementation of best nutrient management practices by farmers. This project complements and builds upon a current 319 grant, Project 00-06/319, "Management Strategies for Massachusetts Dairy Farms to Reduce the Risk of Nonpoint Source Pollution." The new grant will use the tools developed in the current program to further work with farmers and encourage their participation in Comprehensive Nutrient Management Planning.

Tasks under this grant include:

1. Coordination of an inter-agency and farmer advisory committee;

2. Publication of written standards and guidelines for nutrient management practices;

3. Summary of available resources including educational materials, Internet resources, and a list of trained nutrient management planners;

4. Case studies based on development and implementation of nutrient management plans on selected farms;

5. Regional educational workshops and meetings for farmers and professionals; and

6. On-farm demonstrations of nutrient planning and best management practices.

PROJECT COST:	$289,192
FUNDING:	$ 154,620 by the U.S. EPA $ 134,572 by the University of Massachusetts
DURATION:	2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-14/319

PROJECT TITLE:	Forestry Best Management Practices (BMP) Implementation Monitoring Protocol Project
NPS CATEGORY:	Forestry
INVESTIGATOR:	Massachusetts Department of Environmental Management
LOCATION:	Westfield Watershed and Statewide

DESCRIPTION:

The purpose of the project is to develop a forestry BMP monitoring protocol for use in evaluating and monitoring the effectiveness of BMPs in controlling NPS pollution, in conjunction with forest harvesting operations conducted under the state's Forest Cutting Practices Act, Ch. 132 s. 40-48. Tasks include development of assessment methods to evaluate the effectiveness of BMPs contained in the Massachusetts BMP Manual, which are required in the MA Forest Cutting Practices Regulations. This will result in the development of performance standards for forestry BMPs. A draft field manual will be developed explaining the measurement and interpretation procedures. Field surveys on completed harvests in the Westfield watershed will be conducted to test the monitoring protocol, and the manual will be adjusted based on those findings.

The project is consistent with Forestry Actions/Implementation efforts outlined in the Massachusetts Nonpoint Source Management Plan, Volume I, p. 46. As forestry activity is generally regarded to be a source of nonpoint source pollution, particularly phosphorus, the development of performance standards and a rigorous investigation into the effectiveness of forestry BMPs will greatly enhance efforts to implement TMDLs in forested watersheds.

Tasks to be completed under this grant include:

1. Development of reliable assessment methods for evaluating forestry BMPs;

2. Development of performance standards for forestry BMPs;

3. Field surveys on completed harvests in the Westfield Basin to test the protocols and assessment methods being developed and tested; and

4. A field manual explaining the BMP evaluation procedures and performance standards.

PROJECT COST:	$118,203
FUNDING:	$ 70,922 by the U.S. EPA $ 47,281 by the Massachusetts Department of Environmental Management
DURATION:	2002 – 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 00-15/319

PROJECT TITLE: Revision of the Massachusetts Nonpoint Source Management Manual
NPS CATEGORY: General
INVESTIGATOR: GeoSyntec Consultants
LOCATION: Statewide

DESCRIPTION:

The purpose of this consultant contract is to develop and republish a nonpoint source pollution (NPS) management guide for municipal officials on behalf of the Department of Environmental Protection. The Massachusetts Nonpoint Source Management Manual (Manual) was originally published in 1993. The Manual described nonpoint source pollution problems that cause degradation of water quality. The Manual also identified and explained the human activities and multiple land uses associated with NPS pollution problems. Management alternatives for NPS problems were covered in terms of applicable federal, state, and local regulatory programs and appropriate Best Management Practices (BMPs). The Manual was written and designed to be user friendly to local officials who have little or no background knowledge or training in NPS pollution control.

Although the Manual is still useful to local officials, the information is dated and incomplete. The scope of the literature and research on NPS issues has broadened considerably since publication of the Manual, and a great deal of new material is available on the topic. In addition, new regulatory and funding programs such as the Stormwater Management Policy, the Rivers Protection Act, the Total Maximum Daily Load (TMDL) Program, National Pollution Discharge Elimination Program (NPDES), Phase II, the Source Water Protection Program, the 319 and 604b competitive grant programs, and the State Revolving Funds have been established to address NPS problems. Consequently, revisions to the Massachusetts NPS Manual must reflect current knowledge of the subject and new or revised regulatory programs. The revised Manual will be restructured to maximize accessibility of information in electronic format as well as in print.

The project deliverable is a nonpoint source management manual for Massachusetts municipal officials, based on the 1993 Massachusetts Nonpoint Source Management Manual. Revisions to the Manual will reflect current knowledge of the subject and must include information about new regulatory programs and funding options, still in a user-friendly format. The final product will be produced in three versions: hard copy, CD ROM, and Web-based.

Tasks to be completed under this grant include:

1. Development of a revised Massachusetts Nonpoint Source Management Manual in three versions: hard copy, Web-based, and CD-ROM; and
2. A distribution plan that will identify a strategy for effective distribution and evaluation of the revised Manual.

PROJECT COST: $149,943

FUNDING: $ 89,966 by the U.S. EPA
$ 2,500 by GeoSyntec Consultants
$ 57,477 by the Massachusetts Department of Environmental Protection

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-01/319

PROJECT TITLE: Lake Cochituate, Snake Brook NPS Remediation, Phase I
NPS CATEGORY: Watershed Restoration
INVESTIGATOR: Department of Environmental Management
LOCATION: SuAsCo (Concord) Watershed

DESCRIPTION:

The project is Phase I of a larger plan to rehabilitate Lake Cochituate. BMPs will be installed to reduce the heavy loads of sediment in Snake Brook, and ultimately Lake Cochituate. Lake Cochituate is a large, high profile, multiple-use water body in need of restoration. This project will begin to address the sedimentation and nutrient loading from a major inflow (Snake Brook) that has accelerated eutrophication in the lake. It will result in measurable reduction in sediment and nutrient loading to Lake Cochituate prior to determining if dredging will be needed at the mouth of the brook. If dredging is ultimately needed, this project will help ensure that repeated dredging is not required.

Tasks to be completed as part of this project include:

1. Design and construction of a detention pond and wetland enhancement immediately east of where Snake Brook enters Lake Cochituate;
2. Design and construction of a detention pond and wetland enhancement for the drainage channel in the watershed;
3. Design and installation of five stormwater filtration basins along a subwatershed stormwater drain system;
4. Develop a GIS map of the stormwater drainage system within the Snake Brook watershed;
5. Pre- and post-construction water quality monitoring; and
6. Public education campaign.

The project goal is to mitigate sediment and nutrient loads from the Snake Brook watershed by decreasing pollutant loading coming from stormwater. This can restore the recreational, habitat and aesthetic values that have been lost due to sedimentation where Snake Brook enters Lake Cochituate. Project success will be measured through pre-and post-project water quality monitoring. The water quality monitoring program will be designed to measure key indicators of nutrient and sediment loading, including total phosphorus, total suspended solids, and turbidity.

PROJECT COSTS: $235,346

FUNDING: $129,500 by US Environmental Protection Agency
$ 85,950 by the MA Department of Environmental Management
$ 17,600 by the Town of Natick
$ 1,816 by the Town of Wayland
$ 480 in volunteer labor

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-02/319

PROJECT TITLE: Boat Waste Oil Recovery Program for New Bedford Harbor
NPS CATEGORY: Demonstration Project
INVESTIGATOR: Coastal Zone Management Buzzards Bay Project
LOCATION: Buzzards Bay Watershed

DESCRIPTION:

The project implements a portion of the Buzzards Bay CCMP by recovering 30,000 gallons of oil per year. It includes recycling, educating and getting support from commercial vessel operators, marinas and oil retailers, and achieving 100% compliance with Waste Oil Recycling permitting requirements. The proponent estimates that the project will prevent 100,000 gallons of oil from entering New Bedford Harbor and reduce the US Coast Guard's need to respond to chronic small oil spills in the Harbor.

The project addresses a difficult problem, in that small oil spills are hard to trace to individual boats, and fishermen are notoriously hostile toward participating in programs that include regulation or fees. The waste oil recovery facility is a proven technology (it has been used in Texas) that will remain in place after this grant expires. This project complements a waste oil recovery project aimed at recreational boat owners that is currently funded through the CZM CCRP Program.

Tasks to be completed as part of this project include:

1. Construction of the oil reclamation and recycling facility;
2. Operation and maintenance of the facility;
3. Coordination of a Waste Oil Recovery Program with the New Bedford Harbor Development Commission;
4. Coordination and promotion of an enhanced voluntary recycling program for commercial vessels; and
5. Conducting workshops and outreach to improve compliance with Hazardous Waste and Waste Oil regulations.

The success of this project will be evaluated based on:

- The number of gallons of hydrocarbon collected through recycling and reclamation;
- The percentage of oil sold that is recycled and accounted for;
- The percentage of oil retailers accepting oil, which have obtained Waste Oil Recycling permits;
- Any bylaws or regulations adopted to facilitate oil recovery; and
- The number of oil sheen incidents that the US Coast Guard must respond to annually.

PROJECT COST: $300,000

FUNDING: $147,000 by US Environmental Protection Agency
$ 51,000 by the City of New Bedford
$ 96,000 by the New Bedford Harbor Development Commission
$ 1,000 by Coastal Zone Management
$ 5,000 by the Buzzards Bay Project

DURATION: 2001-2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-03/319

PROJECT TITLE: Parker Pond Restoration, Gardner
NPS CATEGORY: Watershed Resource Restoration
INVESTIGATOR: City of Gardner
LOCATION: Millers Watershed

DESCRIPTION:

The project will fund part of Gardner's program to restore the warm water fishery and recreational potential of Parker Pond. It will address stormwater discharges by installing three Vortechs units and a phytoremediation system at a large stormwater discharge point. The larger program to restore the pond includes funded efforts to increase street sweeping, line 650 feet of a major storm drain, and reconstruct the outlet structures and seal the berm of Parker Pond Dam. The Army Corps of Engineers and Gardner are developing plans to dredge about seven feet of soft sediment to return the pond to a depth of ten feet.

The City of Gardner has already demonstrated its commitment to rehabilitating the pond. The ACOE will not proceed with dredging the pond until sediment and nutrient controls are in place in the contributing watershed. This grant will enable a community that has few resources for this type of project to pursue measure that can leverage ACOE participation in the dredging that will restore a recreational and fisheries resource for the City.

Tasks to be completed as part of this project include:

1. Design, permit and install three Vortechs stormwater treatment units;
2. Design, permit and construct a stormwater phytoremediation system at the outlet of Wasa Street;
3. Increase the frequency of street sweeping and stormdrain maintenance in downtown Gardner; and
4. Conduct an outreach and public education program.

The anticipated result of this grant project is to reduce excessive sediment, nutrient and related pollutant loading entering Parker Pond in stormwater from the Wasa Street drainage area. The project proponents anticipate removing 70-90% of sediments from stormwater entering the Vortechs units during the first flush of a rainstorm (based on information provided by the manufacturer). Research cited by the proponent estimates that phosphorus removal through the phytoremediation system will be 50%.

PROJECT COST: $330,000

FUNDING: $198,000 by the US Environmental Protection Agency
$132,000 by the City of Gardner

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-04/319

PROJECT TITLE: Massachusetts Buffer Manual and Demonstration Projects
NPS CATEGORY: Demonstration Project
INVESTIGATOR: Berkshire Regional Planning Commission
LOCATION: Housatonic/Farmington Watersheds

DESCRIPTION:

The project will promote vegetated buffers as an effective and attractive way to minimize NPS pollution. It includes writing and promoting a "Buffer Manual," modeled after Maine's highly regarded manual, and installing five demonstration projects. The demonstrations will be at a wetland site (Berkshire Botanical Garden, Stockbridge), a recreational site (Big Pond, Otis), a riverbank site (Housatonic River, Great Barrington), a vernal pool (Kennedy Park, Lenox), and a lakefront site.

There is an audience and a need for this type of Massachusetts-specific manual accompanied by successful demonstration sites. Vegetated buffers minimize NPS pollution by lowering runoff velocity, trapping sediment, filtering pollutants and absorbing nutrients. However, property owners who desire the typical mowed lawn down to the banks of a lake or stream are often reluctant to maintain or create a buffer that they perceive might impair their access or view of the water. Property owners will more readily accept buffers if they understand the need for buffers and can witness "real life" demonstration projects that show that buffers can be designed to function both as water quality BMPs and as attractive landscape features.

Tasks to be completed as part of this project include:

1. Researching, drafting and distributing the Buffer Manual;
2. Designing, installing and monitoring five demonstration buffers; and
3. Conducting outreach and public education through workshops and on-site demonstrations.

Project success will be evaluated in two ways:

- The overall effectiveness of the demonstration sites will be documented and evaluated through photographing pre- and post-buffer conditions, calculating the increase in vegetative cover and recording the survival rate of the plants over a one-year span.
- Landowner and Conservation Commission views on buffers will be documented and evaluated through surveys of workshop participants. Surveys will also be sent to a wider audience of landowners and Conservation Commissions to develop a more complete profile of public attitudes.

PROJECT COST: $147,440

FUNDING: $ 84,759 by the US Environmental Protection Agency
$ 50,127 by demonstration site owners
$ 2,554 by the MA Department of Environmental Management
$ 10,000 by the MA Watershed Initiative

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-05/319

PROJECT TITLE: Evaluation of Phosphorus Removal in Onsite Septic Systems
NPS CATEGORY: Demonstration Project
INVESTIGATOR: Barnstable County Department of Health and the Environment
LOCATION: Buzzards Bay/statewide

DESCRIPTION:

The project will test a minimum of four different onsite septic technologies that purport to remove phosphorus, and test the efficacy of installing phosphorus-removing reactive media beneath standard septic systems. The project also includes a report on the feasibility of scaling up the tested technologies to serve small clustered areas of development and the potential for using small packaged treatment plants for removing phosphorus from wastewater. The goal is to develop proven options for reducing phosphorus inputs to fresh water bodies from onsite septic systems. Testing will be done at the Massachusetts Alternative Septic System Test Center.

Tasks to be completed as part of this project include:

1. Install four or five technologies and test influent and effluent bi-weekly for one year for orthophosphate, total phosphorus, alkalinity, pH, temperature and dissolved oxygen (technologies to be tested are the Wallax System, the PHOSPHEX, the Waterloo Biofilter, the Krafta Compact Clarifier and one other yet to be identified);
2. Field test at least three different media for their ability to enhance phosphorus removal when installed beneath standard septic systems;
3. Prepare a report that presents options for the control of phosphorus inputs to surface water from septic systems, placing all options in perspective and in context with present state regulations; and
4. Conduct an educational and outreach program, including workshops for Boards of Health and lake associations and publication of research results.

This research project will support implementation of Total Maximum Daily Loads (TMDL) of phosphorus to freshwater bodies that currently do not meet water quality standards. All information that can be used to reduce phosphorus inputs will be vital in implementing lake TMDLs in coming years. It will also further the goals of the Department's Title 5 Program that approves alternative onsite septic systems and alternatives to onsite septic systems where appropriate.

PROJECT COST: $89,358

FUNDING: $53,139 by the US Environmental Protection Agency
$22,500 by the owners of the alternative septic technologies to be tested
$13,719 by the Barnstable County Department of Health and the Environment

DURATION: 2001-2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-06/319

PROJECT TITLE: Memorial Pond Restoration, Phase I
NPS CATEGORY: Watershed Resource Restoration
INVESTIGATOR: Town of Walpole
LOCATION: Boston Harbor (Neponset) Watershed

DESCRIPTION:

The project is the first phase of a larger plan to rehabilitate Memorial Pond in Walpole. Stormwater BMPs (sediment forebays followed by constructed wetlands or extended swales/detention ponds) will be built at two stormwater discharges (Stone Street and East & Diamond Streets) that were identified in *Memorial Pond Investigation and Management Plan* (1999) as major sources of sediment and nutrients to the Pond. It will result in measurable reduction in sediment and nutrient loading to Memorial Pond prior to undertaking a planned dredging project to remove sediments and nuisance aquatic vegetation in the pond. Nonpoint source pollutant inputs will be addressed first to help ensure that repeated dredging is not required. The outlet to the pond will also be rebuilt to allow future drawdowns needed to control nuisance aquatic vegetation.

Tasks to be completed as part of this project include:

1. Design, construct and monitor stormwater BMPs (sediment forebays followed by constructed wetlands or extended swales/detention ponds) at Stone Street and at East and Diamond Streets;
2. Prioritize additional storm discharges for treatment; and
3. Design and construct a modified pond outlet structure with drawdown capability.

The project goal is to mitigate sediment and nutrient loads in Memorial Pond by decreasing contaminants coming from stormwater. This will maintain the pond as an important aesthetic feature in the Town. Project success will be measured through pre-and post-project water quality monitoring. The water quality monitoring program will be designed to measure key indicators of nutrient and sediment loading, including total phosphorus and total suspended solids. Actual measured performance of the stormwater BMPs will be compared to both the predicted performance of the BMPs based on their design, and the performance of similar stormwater BMP systems reported in the literature.

PROJECT COST: $199,950

FUNDING: $119,950 by the US Environmental Protection Agency
$ 80,000 by the Town of Walpole

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-07/319

PROJECT TITLE: Wareham NPS Remediation Program: East River, Broad Cove, Muddy Cove
NPS CATEGORY: Subwatershed Project
INVESTIGATOR: Town of Wareham
LOCATION: Buzzards Bay Watershed

DESCRIPTION:

The northern portion of Onset Bay is closed to shellfishing from May 1st through November 1st, due in large part to fecal contamination associated with stormwater runoff. The 1989 report entitled *Sanitary Survey Report of Onset Bay in the Towns of Bourne and Wareham* identified fecal contamination as the principal contributing factor in shellfish bed closures in the area. The Town of Wareham has made substantial investment to sewer the Onset and Point Independence areas and so has virtually eliminated failing or substandard septic systems as a source of fecal contamination to the Bay. The Town has also undertaken a comprehensive stormwater management program and has made significant progress in remediating stormwater discharges at several problem areas in town.

This project will install stormwater BMPs (i.e.; deep sump catch basins, infiltration chambers and possibly Stormtreat systems) at seven stormwater outlets in Onset village. The BMPs will be installed on town land in the road right-of-way at one site at the East Avenue boat ramp, four sites along North Boulevard, one site at the Stone Bridge Marina and one site off of East Boulevard. The project augments previous projects undertaken by the Town of Wareham to remediate stormwater impacts to local shellfish beds. The work done in this project will be upstream of work done as part of another 319-funded project (00-09/319), which addressed four stormwater outfalls that discharge directly into Onset Bay, and a similar project funded through the CZM CPR Program.

The goals of the project are to upgrade the seasonally closed shellfishing areas of Onset Bay, protect swimming beaches along Onset Bay and begin remediation of estuarine resources in the Bay by reducing fecal coliform entering Onset Bay.

Tasks to be completed as part of this project include:

1. Design, permitting and construction of BMPs for seven discharge locations; and
2. Pre- and post-construction water quality monitoring.

Project success will be monitored through pre- and post-construction water quality monitoring at the stormwater discharge points and through ongoing water quality sampling performed by the Massachusetts Division of Marine Fisheries. Positive effects should be immediately observable as each outlet is remediated. Reducing fecal coliform pollution and improving the health of the shellfish stock will be the ultimate gauge of success for this project.

PROJECT COST: $455,000

FUNDING: $273,000 by the US Environmental Protection Agency
$182,000 by the Town of Wareham

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-08/319

PROJECT TITLE: Gray's Beach Park Restoration, Kingston
NPS CATEGORY: Watershed Restoration Project
INVESTIGATOR: Town of Kingston
LOCATION: South Coastal Watershed

DESCRIPTION:

This project is part of Kingston's 2000 Stormwater Project that seeks to install stormwater BMPs at a number of sites to improve water quality in the Jones River, Kingston Bay and Plymouth Bay. This phase of the overall project is the redesign of the Gray's Beach Park recreation area to reduce soil erosion and pollution caused by stormwater runoff. BMPs to be installed include swales, sand filters, curbing, and deep sump catch basins. Anticipated environmental benefits will be to treat and redirect stormwater away from Kingston's only public swimming beach, and to begin the work needed to reopen the shellfish beds in Kingston Bay that have been closed for several years. This project complements the NPS reductions from ongoing sewer installation in the Rocky Nook area of Kingston and from a nonpoint source pollution remediation project funded through the CZM CPR Program.

Tasks to be completed as part of this project include:

1. Site preparation where sand filters and swales will be constructed;
2. Design and install deep sump catch basins near the boat ramp;
3. Regrade recreational lawn area and design and construct water quality swales and drainage channel parallel to the beach;
4. Install curbing;
5. Regrade beach area and design and construct boulder retaining wall and dunes;
6. Design and construct sand filter to treat stormwater before outfall; and
7. Conduct pre- and post-construction water quality monitoring.

Success of the project will be evaluated through continued water quality monitoring and monitoring for erosion and scouring at the boat ramp and boardwalk area. Short-term environmental improvements include improved water quality in Kingston Bay and Gray's Creek, improved water quality at the public swimming area, and elimination of erosion at the beach and boat ramp. Long-term improvements that are expected from the overall stormwater management program include reopening the closed shellfish beds.

PROJECT COST: $125,000

FUNDING: $75,000 by the US Environmental Protection Agency
$50,000 by the Town of Kingston

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-09/319

PROJECT TITLE: Nashawannuck Pond Restoration, Phase II
NPS CATEGORY: Watershed Resource Restoration
INVESTIGATOR: City of Easthampton
LOCATION: Connecticut Watershed

DESCRIPTION:

Over the past twenty years, Nashawannuck Pond, a large, multiple-use water body within Easthampton, has been reduced in size due to sedimentation caused by residential development and road maintenance. Heavy phosphorus loading resulting from the constant sediment loading is accelerating aquatic weed growth and eutrophication in the pond. This project will implement recommendations from the 1990 Diagnostic/Feasibility study and build upon previous activities to improve the water quality of the pond. Stormwater BMPs (3-6 Vortechs Systems, improvements to eight catch basins, and purchase of a vacuum maintenance system for cleaning the Vortechs units) will be implemented on Broad Brook to reduce sediment and nutrient loads to Nashawannuck Pond. This project will expand on work done to stabilize the banks of Nashawannuck Pond in project 98-05/319.

Tasks to be completed as part of this project include:

1. Design and install three to six Vortechs units along the eastern shoreline of the pond and at two road crossings on Hendricks Street on Broad Brook;
2. Design and install eight deep-sump catch basins between Holyoke Street and the pond;
3. Purchase a maintenance system for the Vortechs units;
4. Prepare an educational video detailing the project;
5. Conduct a training forum for regional Departments of Public Works; and
6. Conduct pre- and post-construction water quality monitoring.

Success of the project will be measured in the long-term by the reduction of sediment in Nashawannuck Pond. Indicators of success in the short-term will be improved water quality measured through the pre- and post-construction water quality monitoring program, and through an analysis of the weight and composition of the sediments removed from the catch basins and Vortechs systems.

PROJECT COST: $171,420

FUNDING: $102,852 by the US Environmental Protection Agency
$ 12,600 by the Pioneer Valley Planning Commission
$ 55,968 by the City of Easthampton

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-10/319

PROJECT TITLE: Development and Demonstration of a Lake Watershed Survey Program
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement/Riverways Program
LOCATION: Statewide

DESCRIPTION:

This project is intended to provide technical assistance for lake/watershed groups to assist them in collecting information and providing stewardship to remediate impaired water bodies. Utilizing the DEP Watershed Survey Manual and data sheets developed in cooperation with DEP, Riverways and other partners, Riverways will educate stakeholders, including citizens and municipal officials, about (1) watershed ecology and general impacts from nonpoint source pollution; (2) causes of nonpoint source pollution in their particular watershed; (3) ways in which stakeholders can work together to address the problems; (4) resources and technical assistance that are available to assist with the endeavor. Lakes with TMDLs and those participating in the EOEA Lakes and Ponds Initiative will be targeted for participation in this project.

The primary objectives of the project are to:

- build stakeholder capacity in each selected watershed;
- develop a clear understanding of watershed issues and possible causes of impairment;
- identify issues and possible causes of impairment in each watershed;
- facilitate efforts leading to remediation of impaired surface waters; and
- ensure continuation of the program through Train The Trainer workshops.

The following tasks will be completed under this project:

1. A Technical Advisory Committee will be established for the program. Agency staff as well as nonprofit lakes and ponds organizations such as COLAP, LAPA West, and MA WaterWatch Partnership will be invited to serve on the committee.
2. The Watershed Survey Coordinator will directly contact and recruit up to 10 lake/watershed groups as project participants. Participants will receive training and technical assistance on nonpoint source pollution and watershed issues. Each group will conduct a watershed survey for its own lake watershed.
3. The Watershed Survey Coordinator will facilitate an action planning meeting in each watershed. Based on the results of watershed surveys, each project participant will develop priorities and action plans for their watershed. Each group will be provided with comprehensive information about potential sources of funding and technical assistance to help carry out the identified actions.
4. The Watershed Survey Coordinator will oversee compilation of a watershed Survey Report for each watershed, summarizing findings of each survey and prioritizing actions to be taken.
5. To ensure that the work continues, at least three future trainers will be recruited to be trained as watershed survey coordinators and facilitators.
6. Project summary and results will be posted and maintained on the worldwide web

PROJECT COST: $177,212

FUNDING: $100,000 by the U.S. Environmental Protection Agency
$ 77,212 by the Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement/Riverways Program

DURATION: 2002 - 2003

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-12/319

PROJECT TITLE: Cranberry Bog Phosphorus Dynamics for TMDL Development
INVESTIGATOR: University of Massachusetts Cranberry Experiment Station
LOCATION: Statewide

DESCRIPTION:

This project will study phosphorus dynamics in selected Massachusetts cranberry bogs to assist the Department in formulating Total Maximum Daily Load (TMDL) performance standards.

Specifically, this project will: (1) determine phosphorus and nitrogen import and export from representative cranberry beds associated with water management, including floods, irrigation, and rain events; (2) determine nitrogen and phosphorus export from a natural freshwater wetland; (3) determine phosphorus and nitrogen export from beds where phosphorus fertilizer rates are reduced to less than 20 lb phosphorus/acre; and (4) determine the impact of reduction in phosphorus fertilization on cranberry sustainability.

Tasks include:

1. Preparation of a Quality Assurance Project Plan (QAPP);
2. Select and study six bogs and one natural wetland reference site;
3. Determine water and nutrient budgets;
4. Perform soil nutrient and tissue analysis;
5. Monitor crop yields and crop quality; and
6. Conduct field fertilizer plot experiments.

PROJECT COST: $288, 040

FUNDING: $187, 197 by the U.S. Environmental Protection Agency
$100, 843 by the University of Massachusetts

DURATION: 2001-2004

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-13/319

PROJECT TITLE: Lake Buel Implementation and Demonstration Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Berkshire Regional Planning Commission
LOCATION: Housatonic Watershed

DESCRIPTION:

Lake Buel is 303d listed for nutrient impairment. A D/F study completed for the lake in 1982 indicates that a large volume of the total annual phosphorus load enters from the northern inlet. Several other subsequent studies have also addressed the impairment problems at Lake Buel, particularly the infestation of non-native aquatic species related to excess nutrients/phosphorus. Many of the recommendations of those studies have already been implemented, including weed harvesting and water quality monitoring.

This project seeks to implement remaining recommendations of the D/F study and the 1997 MADEP Water Quality Assessment. The following tasks will be conducted as part of this project:

1. Monitor water quality and develop a QAPP;
2. Design and install one or more stormwater BMPs at the north cove inlet;
3. Conduct a plant replacement project to establish *Chara*, a native non-nuisance species, as a replacement for the currently dominant milfoil;
4. Design and install one or more stormwater BMPs at the public boat ramp;
5. Develop a septic system maintenance program for the Lake District;
6. Develop drainage standards for subdivisions in watershed communities;
7. Conduct annual weed harvesting; and
8. Develop and conduct an outreach and education program.

PROJECT COST: $164,846

FUNDING: $ 98,346 by the U.S. Environmental Protection Agency
$ 2,000 by the Berkshire Regional Planning Commission
$ 16,000 by the Massachusetts Public Access Board
$ 48,500 by the Lake Buel Restoration Preservation District

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-14/319

PROJECT TITLE: Pontoosuc Lake Watershed Resource Restoration Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Lanesborough
LOCATION: Housatonic River Watershed

DESCRIPTION:

This project builds upon a FFY 99 s319 project (99-03/319) to implement recommendations of a 1999 D/F study. Three other reports have also been completed, each documenting the problems at Pontoosuc Lake. Several recommendations from those studies have been implemented to date. This project will install a stormwater BMP that was designed under the previous grant. In addition, areas of erosion near the BMP locations will be stabilized to prevent sedimentation from entering the lake. The Housatonic Valley Association will conduct a storm drain stenciling and public outreach program to help watershed residents understand the role they can play in reducing NPS, and an ongoing weed harvesting program will be continued.

Activities under this grant that seek to further improve water quality at Pontoosuc Lake include:

1. Installing a stormwater BMP in a priority location;
2. QAPP development and water quality monitoring;
3. Stenciling storm drains;
4. Erosion control;
5. Weed harvesting; and
6. Implementing source controls.

PROJECT COST: $93,883

FUNDING: $ 55,990 by the U.S. EPA
$ 31,455 by the Town of Lanesborough
$ 750 by the Housatonic Valley Association
$ 5,000 by the Berkshire Regional Planning Commission
$ 688 by the Housatonic EOEA Watershed Team

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-15/319

PROJECT TITLE: Implementing a Stormwater Remediation Strategy at Ashmere Lake
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Hinsdale
LOCATION: Housatonic Watershed

DESCRIPTION:

Ashmere Lake is 303d listed for noxious aquatic plants. Several studies have identified problems at the Lake and have recommended solutions. This project seeks to implement a comprehensive stormwater remediation strategy recommended by studies to prevent sedimentation from gravel roads and prevent the spread of non-native aquatic species. The Town will be supported by the Berkshire Regional Planning Commission in carrying out this project.

Specific tasks include:

1. Develop a QAPP and conduct pre-and post-construction monitoring;

2. Design and install BMPs for road runoff diversion and treatment;

3. Prepare an operation and maintenance plan and program for catch basin maintenance;

4. Conduct an outreach and technology transfer program that includes a storm drain stenciling program, signage at lake access points, and training for municipal officials using the NEMO model;

5. Develop a lake management plan; and

6. Conduct in-lake treatment of non-native invasive aquatic plant species.

PROJECT COST: $175,926

FUNDING: $104,610 by the U.S. EPA
$ 66,020 by the Town of Hinsdale
$ 2,250 from the Berkshire Regional Planning Commission
$ 3,046 from the Housatonic Valley Association

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-16/319

PROJECT TITLE: Plymouth Road Stormwater Treatment System
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Bellingham Department of Public Works
LOCATION: Charles River Watershed

DESCRIPTION:

The Charles River is 303d listed in several locations for multiple pollutants including nutrients, organics, low dissolved oxygen, and pathogens. The Town's Comprehensive Water Resources Management Plan indicates that overland stormwater runoff plays a large role in the degradation of Charles River water quality.

This project will install a stormwater treatment system consisting of a degritter, oil/water separator, and infiltration trenches at the outfall to the Charles River on Plymouth Road. This system is anticipated to reduce the discharge of first flush TSS to zero, and remove 80% of TSS for the 2-year 24-hour storm. The infiltration feature of the BMP will recharge groundwater upstream of the outfall to help maintain flows during dry weather.

Tasks to be completed under this grant include:

1. Develop a QAPP and conduct pre- and post-water quality monitoring;

2. Design and construct a stormwater treatment system; and

3. Develop and implement an outreach and technology transfer program.

PROJECT COST: $79,960

FUNDING: $45,000 by the U.S. EPA
$34,960 by the Town of Bellingham

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-17/319

PROJECT TITLE: North Green Stormwater Management Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Ipswich Department of Public Works
LOCATION: Ipswich River Watershed

DESCRIPTION:

The North Green area is located in downtown Ipswich, adjacent to the Ipswich River. There is no enclosed drainage system in this area, and stormwater runoff sheet-flows into the Ipswich River. Two studies prepared for the Town of Ipswich conclude that urban runoff is the largest contributing factor to stormwater pollution in the Ipswich River.

The goal of this project is to treat stormwater from the North Green area before it enters the river. This will be accomplished by constructing a closed drainage system in the area, consisting of deep sump catch basins, catch basins with outlet hoods, and Stormceptor/Vortechs units. It is anticipated that 80% of TSS will be removed from the stormwater prior to discharge into the River. Matching funds will come from Coastal Pollution Abatement Funds and from local Ch. 90 money, as well as in-kind contributions from the Town.

Tasks for this project include:

1. Develop a QAPP and conduct pre- and post construction water quality monitoring;
2. Field survey of the project area;
3. Environmental permitting;
4. Engineering, design and construction of a closed drainage system; and
5. Outreach and technology transfer.

PROJECT COST: $398,548

FUNDING: $228,000 by the U.S. EPA
$ 50,000 by the Massachusetts Coastal Zone Management
$120,548 by the Town of Ipswich, including $62,000 of Chapter 90 funds

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-18/319

PROJECT TITLE: Lagoon Pond Runoff Renovation Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Oak Bluffs
LOCATION: Islands Watershed

DESCRIPTION:

Lagoon Pond receives direct discharge of untreated stormwater at three locations. Fecal coliform bacteria is a known pollutant carried by this runoff. Nitrogen, phosphorus, and BOD typical of residential stormwater are also suspected to be present. A Lagoon Pond study funded by 604(b) identified this situation as needing corrective action.

The project will infiltrate and thereby treat the first flush of stormwater from the three sources to remove bacteria, BOD, and phosphorus. This will be accomplished by installing catch basins and infiltration systems designed to capture the first flush of stormwater.

Tasks to be completed under this project include:

1. Construction of runoff interception, infiltration and treatments systems at three subwatersheds; sites: Vineyard Avenue, Lagoon Road, and Hudson Avenue; and

2. Outreach and technology transfer through placement of educational signage at each project area and regular press releases.

PROJECT COST: $ 122,745

FUNDING: $ 73,030 by the U.S. EPA
$ 48,966 by the Town of Oak Bluffs
$ 750 by the Dukes Conservation District

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-19/319

PROJECT TITLE: Oldham and Furnace Pond Stormwater Treatment
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Pembroke
LOCATION: South Coastal Watershed

DESCRIPTION:

A 1993 D/F study found high levels of nutrients and invasive aquatic vegetation in both Oldham Pond and Furnace Pond. Stormwater impacts were also noted in the study. A subsequent DEM study made specific recommendations for stormwater BMPs.

This project will implement structural and non-structural BMPs to prevent the key pollutant, phosphorus, from entering the ponds. This will be done by converting twenty-nine catch basins to leaching catch basins; cleaning, widening, and revegetating a drainage ditch; and strengthening local controls on sedimentation and erosion.

Tasks to be completed under this grant include:

1. Design, permitting and construction of stormwater best management practices at twenty-nine locations;

2. Modification of town sedimentation and erosion control bylaws and regulations;

3. A DEP- and EPA-approved QAPP for monitoring the effectiveness of the BMPs; and

4. Development and distribution of educational brochures targeted to watershed residents about lawn care and fertilizer use, pet waste, and waterfowl management. Letters will be sent to lawn care professional encouraging conservative application of fertilizers in the watershed.

PROJECT COST: $194,448

FUNDING: $116,669 by the U.S. EPA
$ 77,779 by the Town of Pembroke

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-20/319

PROJECT TITLE: Lake Attitash Stormwater Treatment Program
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Town of Amesbury
LOCATION: Merrimack Watershed

DESCRIPTION:

Lake Attitash is a 360-acre natural lake used for recreation. Water quality in the Lake has been a problem for several years, evidenced by algae and weed growth as well as beach closures. Previous studies have indicated that stormwater is a significant contributor to the water quality problems.

Based on recommendations from a DEM-funded study, this project focuses on implementation of structural and non-structural stormwater BMPs in one of the largest direct drainage contribution areas of Lake Attitash. Three direct discharges will be treated by one structural BMP, consisting of a series of baffle tanks designed to reduce velocity and trap sediment.

Tasks to be performed include:

1. DEP and EPA approved QAPP to determine the effectiveness of the BMPs;

2. Design, permitting and installation of stormwater best management practices at three direct discharges into the Lake; and

3. A half-day seminar to present project results to watershed residents, and others.

PROJECT COST: $163,675

FUNDING: $98,205 by the U.S. EPA
$65,470 by the Town of Amesbury

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-21/319

PROJECT TITLE: Lake Quinsigamond and Lake Ripple Restoration Project
NPS CATEGORY: Resource Restoration
INVESTIGATOR: Lake Quinsigamond Commission
LOCATION: Blackstone River Watershed

DESCRIPTION:

Water quality in Lake Quinsigamond and Lake Ripple has degraded due to increased urban runoff and nutrient loading, as identified in the TMDL for Lake Quinsigamond and a 1987 D/F study. Lake Quinsigamond is 303d-listed for nuisance aquatic plants and organic enrichment/low dissolved oxygen. Lake Ripple suffers from high salt and sand runoff from Routes 122 and 140. No TMDL has been done for Lake Ripple, but the grantee feels it would be unlikely to meet clean water standards.

The project will implement structural and nonstructural BMPs to address NPS pollution, primarily phosphorus, in the Lake Quinsigamond watershed, and sediment loading in Lake Ripple. This project is identified as a priority in the Blackstone River Basin FY 2001 EOEA Watershed Team Workplan.

Specific tasks include

1. Water quality sampling;
2. Design and installation of a sediment removal BMP for Lake Ripple;
3. Stream bank restoration in the Quinsigamond River;
4. Mapping of storm drains into Lake Quinsigamond and Flint Pond;
5. Installation of a phosphorus and sediment removal BMP for Lake Quinsigamond; and
6. Removal of sediment under Route 20 at Half Moon Bay.

PROJECT COST: $405,000

FUNDING:

$243,000 by the U.S. EPA	$ 3,000 Grafton DPW
$ 67,500 Shrewsbury Engineering Dept.	$ 13,800 Town of Shrewsbury
$ 25,740 Graves Engineering/Town of Grafton	$ 24,800 MA Environmental Trust
$ 4,360 Lake Quinsigamond Commission	$ 2,000 Shrewsbury Health Dept
$ 3,000 Shrewsbury Highway Dept.	$ 6,000 Students/Grafton H.S. and Shrewsbury H.S.

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-22/319

PROJECT TITLE: Stormwater Management Plan at the Millyard Marketplace
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Sturbridge
LOCATION: Quinebaug Watershed

DESCRIPTION:

Impervious parking area around the Millyard Marketplace, which is adjacent to the Quinebaug River, causes flash flooding during storm events. In addition, stormwater runoff from the parking lot contributes non-point source pollution directly into the River. This project focuses on implementing BMPs that will abate the flash flooding and improve the water quality of discharge at the Marketplace.

BMPs to be implemented include construction of 250 linear feet of low-gradient trough around portions of the parking area that will detain sediment, and 440 linear feet of low-gradient, serpentine grassed waterway that will remove fines and nutrients. A vortex-type BMP will be installed to treat stormwater flowing from the storm sewer at Route 20, and a concrete sediment basin will be installed at the Route 20 outlet pipe. Two new catch basins will be installed to better control the Route 20 stormwater. A new public park will be created that will include an educational kiosk. This is a priority project in the FY 2002 French/Quinebaug EOEA Watershed Team Plan.

Tasks to be completed under this grant include:

1. Planting swales and filter strips to slow runoff into the river;

2. Removal and relocation of a parking lot and widening of the existing buffer;

3. Installation of improved drainage from Route 20;

4. Renovation of an existing detention basin to improve volume and filtration capacity; and

5. Creation of a new public park with education kiosk.

PROJECT COST: $ 86,660

FUNDING: $ 51,660 by the U.S. EPA
$ 35,000 by the Massachusetts Turnpike Authority

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-23/319

PROJECT TITLE: Demonstration of Innovative Stormwater Management Retrofit Systems
NPS CATEGORY: Urban runoff
INVESTIGATOR: Center for Urban Watershed Renewal
LOCATION: North Coastal Watershed

DESCRIPTION:

The project seeks to demonstrate the feasibility of retrofitting existing urbanized landscapes with best management systems that will increase infiltration rates, provide filtering mechanisms for stormwater runoff, and improve the water quality of runoff. The project will install a volume dependent stormwater retention planter, a vegetated infiltration system, and a vegetated roof at two sites on the North River in Salem.

Tasks to be completed include:

1. Prepare a final design for the stormwater retrofitting systems;

2. Site preparation for installation of stormwater management retrofitting systems;

3. Construction of stormwater management retrofitting systems, including volume-dependent stormwater retention planters; vegetated infiltration systems; structural support for vegetated roofs; and vegetated roofs;

4. Preparation and implementation of QAPP for monitoring pre- and post- construction effectiveness of BMPs; and

5. Technology transfer including production of a documentary video, open houses, seminar and training session, and final report relating project details.

PROJECT COST: $175,370

FUNDING: $ 85,637 by the U.S. EPA
$ 89,733 by The Bioengineering Group, Inc.

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-24/319

PROJECT TITLE: Storm Water System Maintenance and Residuals Waste Handling
NPS CATEGORY: Urban Runoff
INVESTIGATOR: City of Quincy
LOCATION: Boston Harbor Watershed

DESCRIPTION:

Storm water runoff is negatively impacting the natural and recreational resources at Wollaston Beach. Chronic bacteria problems cause frequent swimming advisories and have a negative impact on surrounding marsh areas. Stormwater from eight outfalls discharges directly onto Wollaston Beach. The City has developed a five-year capital plan to restore water quality at Wollaston Beach. The plan includes eliminating sources of pollution by upgrading sewer and storm drains.

The project seeks to obtain a Beneficial Use Determination for catch basin residuals. Disposal of catch basin residuals is a statewide problem that will grow more serious with the onset of Phase II Stormwater requirements, and development of a BUD is seen as the first step toward solving the problem on a statewide basis. Anticipated results include development of guidelines for other cities and towns seeking to use a similar strategy for disposal of this material. Ideally, the quality of catch basin residuals can be related to land use surrounding the catch basin, enabling development of a set of standard land use-based protocols.

Tasks under this project include:

1. Assessment of city stormwater collection procedures including development and implementation of a DEP- and EPA-approved QAPP;

2. Development of an operation and maintenance plan for the existing collection system;

3. Construction of a processing area for catch basin residuals; and

4. Development of additional Beneficial Use Determinations based on collected data.

PROJECT COST: $ 143,389

FUNDING: $ 85,535 by the U.S. EPA
$ 57,854 by the City of Quincy

DURATION: 2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 01-25/319

PROJECT TITLE:	Operation and Maintenance of the Massachusetts Alternative Septic System Test Center
NPS CATEGORY:	Land Disposal
INVESTIGATOR:	Barnstable County Dept. of Health and the Environment
LOCATION:	Statewide

DESCRIPTION:

This project will continue to operate and maintain the very successful Massachusetts Alternative Septic System Test Center located at the Otis Air National Guard Base on Cape Cod. MASSTC monitors the contaminant removal capabilities of conventional and alternative wastewater treatment systems. This provides a body of verified, comparable data about the effectiveness of these systems, which is disseminated to state regulators and local officials. With this project, the MASSTC seeks to continue its current operation while expanding the program to accept and test as many other new technologies as possible. In addition, the MASSTC is open as a training and educational facility to various groups who wish to observe first-hand the systems that are undergoing evaluation.

Tasks to be completed include:

1. Conducting regular facility operations;

2. Solicitation, testing, research, and development of new on-site technologies;

3. Data analysis and synthesis into report format;

4. Tours and educational outreach for Test Center visitors, including regulators, municipal officials, contractors, realtors, engineers, designers, and others; and

5. General outreach and education including presentations, workshops, and the publication of articles.

PROJECT COST:	$250,273
FUNDING:	$150,164 by the U.S. EPA $100,109 from Vendors, through the ETV program
DURATION:	2002 - 2005

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-01/319

PROJECT TITLE: Indian Lake Watershed Resource Restoration
NPS CATEGORY: Urban Runoff
INVESTIGATOR: City of Worcester Department of Public Works
LOCATION: Blackstone Watershed

DESCRIPTION:

Indian Lake is the largest body of water located completely within the City of Worcester. The Lake's 2000-acre watershed area is heavily urbanized. Over the past 50 years, development within the Mill Brook watershed has increased dramatically, which has caused water quality problems. Sedimentation and high phosphorus loads have led to eutrophication of the Lake with 303d listed impairment of water quality from low dissolved oxygen, nuisance aquatic plants, and organic enrichment.

This project is part of a comprehensive effort to improve water quality and recreational opportunities at Indian Lake and in the surrounding watershed by treating polluted urban stormwater runoff, which results in sedimentation and nutrient inputs to the Lake and its tributaries. Structural Best Management Practices (BMPs) will be installed to remove sediment and nutrients from stormwater entering the Lake, while public outreach and education will help to reduce watershed contaminants at the source.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and installation of a series of structural Best Management Practices (BMPs) to prevent contaminated runoff from reaching the Lake;
4. Conducting minor repairs to the impoundment dam;
5. Implementation of a long-term weed control plan;
6. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
7. Outreach and education to stakeholders.

PROJECT COST: $ 437,900

FUNDING:
$ 253,000 by the U.S. EPA
$ 3,000 City of Worcester Department of Public Health
$ 103,060 City of Worcester Department of Public Works
$ 6,400 City of Worcester Parks, Recreation and Cemetery Department
$ 57,290 Indian Lake Watershed Association
$ 1,500 Morgan Construction/Norton Co.
$ 1,000 Regional Environmental Council
$ 5,000 Tighe and Bond
$ 5,150 Worcester Polytechnic Institute

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-02/319

PROJECT TITLE: Wall Street Highway Yard Stormwater Improvements Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: City of Attleboro
LOCATION: Ten Mile Watershed

DESCRIPTION:

The City of Attleboro's Wall Street Highway Yard is a 6.6-acre parcel on the banks of the Ten Mile River. There is currently no treatment or buffer for stormwater runoff from the highway facility. The drainage system from the highway yard discharges directly into the River from two outfalls and two overland flow locations. Documented water quality data for similar facilities shows that oil and grease, automotive fluids, sediment, metals, nutrients, and toxic chemicals are among the nonpoint source pollutants likely to be found in runoff from the site. The site directly abuts the Ten Mile River, which is 303d listed for toxicity, metals, nutrients, organic enrichment/low dissolved oxygen, and pathogens.

The goal of this project is to improve water quality and the physical and biological health of the riparian corridor at this site by implementing structural and non-structural Best Management Practices to reduce non-point source pollution entering the Ten Mile River from this location.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Work at several locations to implement installation of six new storm drain inlet catch basins;
4. Construction of a bioretention facility and swale;
5. Improved overland drainage into infiltration systems;
6. Installation of vegetated riparian buffers;
7. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
8. Education of facility users about BMPs to be used on-site.

PROJECT COST: $260,825

FUNDING: $155,975 by the U.S. EPA
$104,850 by the City of Attleboro

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-03/319

PROJECT TITLE: Stormwater Management on the Middle Pond of the Congamond Lakes
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Pioneer Valley Planning Commission
LOCATION: Westfield Watershed

DESCRIPTION:

The Congamond Lakes are three interconnected ponds: North, Middle, and South Ponds. Together, the three ponds are approximately three miles long and up to one-third of a mile wide, with a total surface area of 465 acres. The Congamond Lakes are 303d listed for noxious aquatic plants. The Lakes are heavily used for recreational purposes, and the eutrophication of the Lakes has become a deterrent to recreation as well as a potential health hazard.

The purpose of this project is to address the quality of street runoff entering Middle Pond of the Congamond Lakes from the Berkshire Avenue Sub-basin drainage area. A diagnostic/feasibility study conducted in 1983 recommended stormwater management measures, including structural Best Management Practices as well as watershed controls for source reduction of pollutants.

Project tasks include

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and construction of a detention basin with a water quality swale;
4. Removal of accumulated in-lake sediment;
5. Development of stormwater control bylaws;
6. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
7. On-site technical assistance for watershed residents.

PROJECT COST: $ 155,435

FUNDING: $ 92,935 by the U.S. EPA
$ 62,500 by the Town of Southwick

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-04/319

PROJECT TITLE: Implementing Nonpoint Source BMPs at Richmond Pond
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Richmond/Richmond Pond Association
LOCATION: Housatonic Watershed

DESCRIPTION:

Richmond Pond is a 218-acre water body that is listed as impaired by noxious aquatic plants (invasives) in the 1997 DEP water quality assessment report. The Pond is heavily used for recreation by residents and by several camps. The heavy weed growth impairs swimming and boating on the Pond. Results of a 1990 Diagnostic/Feasibility study indicate that the installation of structural and non-structural dirt road best management practices, installation of buffers along shoreline and tributary corridors, and installation of detention basins at tributary inlets will improve water quality in Richmond Pond, thus helping to control weed growth.

Project goals include implementation of watershed and in-lake BMPs to mitigate NPS, restoration and protection of recreational uses and habitat value, and implementation of D/F recommendations for the elimination and control of invasive aquatics. This project will also implement recommendations from a stormwater assessment report, 99-10/MWI, to address stormwater and erosion around the lake.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and install a detention pond;
4. Drainage improvements;
5. Installation of vegetative buffers;
6. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
7. Education and outreach work, which will feature brochures and training workshops for watershed residents about buffer design and installation.

PROJECT COST: $ 92,000

FUNDING: $ 55,200 by the U.S. EPA
$ 36,800 by the Town of Richmond

DURATION: 2003 – 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-05/319

PROJECT TITLE: Neponset River Watershed Bacteria TMDL Implementation Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Neponset River Watershed Association
LOCATION: Boston Harbor/Neponset Watershed

DESCRIPTION:

Much of the Neponset River and many of its tributaries fall short of their designated uses for primary and secondary contact recreation due to bacterial pollution. Many point sources of bacterial pollution have been identified and addressed by DEP and NepRWA in the past decade, but mainstem bacteria problems persist. Many tributaries are also included on the 303 d list for other impairments including sedimentation, toxicity, aesthetics, habitat degradation, and temperature. A draft TMDL has been developed for bacteria in the Neponset River. This project seeks to comprehensively implement the recommendations of the draft TMDL, with the goal of abating the worst sources of NPS bacterial pollution and restoring designated uses of the Neponset River.

The project focuses on four major strategies: managing residential stormwater runoff, ensuring proper maintenance of septic systems, detailing sources of NPS bacteria as called for in the TMDL, and a strong outreach and technology transfer component. Project success will be gauged through water quality monitoring, and ultimately by the number of stream segments restored to their designated uses.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-implementation water quality monitoring to document project results;
3. Design and installation of structural BMPs (enhanced wetland, phyto-enhanced buffer, bioretention cells) on Pine Tree Brook;
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Outreach and education about watershed BMPs and proper septic maintenance.

PROJECT COST: $ 472,152

FUNDING: $ 283,005 by the U.S. EPA
$ 40,577 by the Neponset River Watershed Association
$ 116,654 by the Town of Milton
$ 31,915 by the Town of Walpole

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-06/319

PROJECT TITLE: Head of Westport Stormwater Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Westport
LOCATION: Buzzards Bay Watershed

DESCRIPTION:

In the Town of Westport, the Westport River has 35 miles of shoreline and drains approximately 85% of the town's land area. The river supports an extensive and productive estuarine habitat including over 1000 acres of salt marsh vegetation. Within the estuary, there are approximately 3000 acres of shellfish beds. Two branches of the River, the East Branch and the West Branch, converge at Westport Point to form a single discharge into Buzzards Bay. The tidal component of the East Branch extends from the area known as the Head of Westport to the mouth of the river. The watershed of the East Branch is the larger of the two branches and consists primarily of agricultural and residential land use in the lower region, and forest in the upper part. Currently, the East Branch of the Westport River from Lake Noquochoke to the West branch is 303d listed for pathogens. This bacterial contamination threatens the health of the shellfish beds located within the watershed, causing restrictions on harvesting.

The goal of the project is to improve water quality in the East Branch by reducing nonpoint source pollution at the Head of Westport through implementation of a combination of structural stormwater control Best Management Practices to remove bacteria from the first flush of stormwater, and public outreach and education to watershed stakeholders.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Construction of a sediment forebay for pretreatment of stormwater runoff before discharge into two retention ponds;
4. Construction of a sediment basin to discharge into a constructed wetland;
5. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
6. Outreach and education to watershed stakeholders in collaboration with the Buzzards Bay Program.

PROJECT COST: $ 444,144

FUNDING: $ 264,332 by the U.S. EPA
$ 160,441 by the Town of Westport
$ 19,371 by the Westport River Watershed Alliance

DURATION: 2003 – 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-07/319

PROJECT TITLE: Lake Singletary Storm Drain Retrofit Program
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Millbury
LOCATION: Blackstone Watershed

DESCRIPTION:

Lake Singletary lies in the towns of Millbury and Sutton. The Lake shows signs of eutrophication, including periodic algae blooms, reduced transparency, and infestation of nuisance aquatic plants. The degraded condition of the Lake impairs recreational and aesthetic values of Lake Singletary. A Diagnostic/Feasibility study and a lake management plan have been completed, with a recommendation that phosphorus loads to the lake must be reduced to slow the eutrophication process. Management options proposed in the lake management plan include stormwater management to reduce sedimentation and nutrient loading.

The Town of Millbury will coordinate with the Town of Sutton and the Lake Singletary Watershed Association to implement BMPs by retrofitting 20 existing stormwater structures and enhancing three wet detention swales and catch basins. Outreach and education will be undertaken by the LSWA, who will carry out such projects as storm drain stenciling, maintaining a web site, and producing a video for local cable access television.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Retrofit of 20 existing catch basins;
4. Repair and enhancement of three wet detention swales and catchment areas;
5. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
6. Outreach and education to watershed stakeholders about nonpoint source pollution and water quality issues.

PROJECT COST: $ 134,329

FUNDING: $ 70,907 by the U.S. EPA
$ 53,022 by the Towns of Millbury and Sutton
$ 10,000 by the Lake Singletary Watershed Association
$ 400 by the Boy Scouts of America

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-08/319

PROJECT TITLE: Hammond Pond Stormwater Management Plan Implementation Phase I
NPS CATEGORY: Urban Runoff
INVESTIGATOR: City of Newton
LOCATION: Charles Watershed

DESCRIPTION:

Hammond Pond is a shallow 22-acre freshwater kettle pond. Its watershed is approximately 167 acres, located in Newton and Brookline. Dominant land use of the watershed (38%, 64 acres) is commercial. The Pond is widely used for recreational and aesthetic purposes including catch and release fishing, bird watching, and canoeing. Hammond Pond is experiencing accelerated eutrophication and bacterial contamination, and is 303d listed for noxious aquatic plants. 71% of the Pond's inflow is from rainwater. Stormwater runoff and direct contamination by large numbers of waterfowl are regarded as the primary causes of the impairments.

This project proposes implementation of several high-priority projects that are recommended in an overall master plan. The goal is to treat the greatest amount of runoff possible, with the greatest quantifiable pollutant load removal. The proximity of the site to a very large shopping mall, coupled with the heavy recreational use of the Pond, will maximize the opportunity for outreach and education to stakeholders, as well as the visibility and technology transfer of the Best Management Practices that will be used.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design, permitting, and installation of Phase I BMPs (bioretention facilities, sand filter, Vortechs unit, buffers, forebay, paving modification)
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Outreach and education to stakeholders about waterfowl feeding and other NPS problems.

PROJECT COST: $ 249,257

FUNDING: $ 149,500 by the U.S. EPA
$ 74,075 by the City of Newton
$ 12,160 by the Friends of Hammond Pond
$ 500 by the Chestnut Hill Village Alliance
$ 1,000 by the Charles River Neighborhood Foundation
$ 6,022 by the Charles River Watershed Association
$ 6,000 by the Chestnut Hill Garden Club

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-09/319

PROJECT TITLE: Stormwater Remediation for Plymouth Harbor and Plymouth Bay
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Plymouth Department of Public Works/Engineering
LOCATION: South Coastal Watershed

DESCRIPTION:

Plymouth Harbor is listed on the 303(d) list of impaired waters due to bacterial contamination from stormwater runoff. This bacterial contamination has caused beach closures in the Harbor and has contributed to the prohibition of shellfishing in Plymouth Harbor and Plymouth Bay. The Town of Plymouth is undertaking a comprehensive, three-phase program to address bacterial pollution in the area. The first two phases, which are fully funded and underway, are the expansion and improvement of the Plymouth Wastewater Treatment Plant and a new Plymouth Harbor Pump-Out Program. The Pump-Out Program provides a pump-out boat that services recreational vessels in the Harbor, and provides a shoreside pump-out facility that can accommodate larger commercial boats and the residential fleet.

This project will fund and implement the third phase of the Town's comprehensive clean-up program. It addresses the impacts of non-point source pollution due to stormwater runoff from the watershed. A substantial amount of study has already been completed by the Town to determine the most appropriate approach to this phase of the work. Three Best Management Practices (BMPs) will be designed and installed in locations that have been selected to provide the maximum amount of remediation. These BMPs will be infiltration stormwater treatment devices for removal of bacteria. Pre-and post-implementation water quality monitoring will be conducted in accordance with a Quality Assurance Project Plan in order to measure and document project success. Development and implementation of an Operation and Maintenance Plan will ensure that the BMPs continue to function properly. The Town will promote outreach and education about this project through a variety of activities including press releases, local events, and through the Town's web site.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Final design and installation of stormwater BMPs in three locations;
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Outreach and education about the project.

PROJECT COST: $ 435,000

FUNDING: $ 249,000 by the U.S. EPA
$ 186,000 by Town of Plymouth

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 02-10/319

PROJECT TITLE: Implementation of TMDL Recommendations at Lake Boon
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Lake Boon Commission (Town of Stow)
LOCATION: SuAsCo Watershed

DESCRIPTION:

Lake Boon is a 163-acre great pond located in the towns of Stow and Hudson. The Town of Stow will administer this contract on behalf of the Towns of Stow and Hudson and the Lake Management Commission. The 1000-acre watershed is a mix of forest and residential development, with many lakefront cottages that been converted into year-round homes. The Lake is divided into four basins, the first and largest of which is largely natural. The remaining three basins are man-made as a result of damming of the outlet pond in the mid 1800's. The second, third and fourth basins are overgrown with invasive weeds that have spread considerably in the last decade. Lake Boon is 303d listed for nuisance aquatic plants, and a TMDL for phosphorus is in the final draft stages.

Activities proposed have been recommended in at least one of three studies that have been completed for the Lake. The project goal is to improve water quality in the Lake through installation of structural stormwater treatment devices, and to reduce non-point source pollution at the source by encouraging good practices among watershed residents and stakeholders. An aquatic plant replacement program will also be conducted.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs;
4. Conducting a lake watershed survey;
5. Installation of 26 stormwater BMPs (leaching catch basins);
6. Development and implementation of a septic pumping reminder program;
7. A plant replacement program; and
8. Educational brochures and outreach to stakeholders.

PROJECT COST: $ 143,214

FUNDING: $ 84,692 by the U.S. EPA
$ 49,322 by the Towns of Stow and Hudson
$ 1,200 from the Lake Boon Commission
$ 8,000 from the Lake Boon Improvement Association

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 03-01/319

PROJECT TITLE: Operation and Maintenance of the Massachusetts Alternative Septic System Test Center
NPS CATEGORY: Land Disposal
INVESTIGATOR: Barnstable County Dept. of Health and the Environment
LOCATION: Statewide

DESCRIPTION:

This project will continue to operate and maintain the very successful Massachusetts Alternative Septic System Test Center located at the Otis Air National Guard Base on Cape Cod. MASSTC monitors the contaminant removal capabilities of conventional and alternative wastewater treatment systems. This provides a body of verified, comparable data about the effectiveness of these systems, which is disseminated to state regulators and local officials. With this project, the MASSTC seeks to continue its current operation while expanding the program to accept and test as many other new technologies as possible. In addition, the MASSTC is open as a training and educational facility to various groups who wish to observe first-hand the systems that are undergoing evaluation.

This continuing project endeavors to support the state's developing TMDL program by providing environmental decision makers with the tools by which the goals of the TMDL program can be achieved, especially where wastewater is a major source of pollutant loading. The project proposes to continue the ongoing work of the MASSTC. Tasks include conducting facility operations, synthesizing data derived from testing of new systems, reporting on test results, and providing outreach and education at the test center and through published reports and articles.

Tasks to be completed include:

1. Conducting regular facility operations;
2. Solicitation, testing, research, and development of new on-site technologies;
3. Data analysis and synthesis into report format;
4. Tours and educational outreach for Test Center visitors, including regulators, municipal officials, contractors, realtors, engineers, designers, and others; and
5. General outreach and education including presentations, workshops, and the publication of articles.

PROJECT COST: $ 206,731

FUNDING: $ 124,005 by the U.S. EPA
$ 34,226 by the Barnstable County Dept. of Health and the Environment
$ 48,500 by technology vendors (ETV program of the US EPA)

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 03-02/319

PROJECT TITLE: Comparison Of Virus Removal In Aggregate Free Chamber Leaching Systems vs. Aggregate Laden Trenches
NPS CATEGORY: Land Disposal
INVESTIGATOR: Barnstable County Dept. of Health and the Environment
LOCATION: Statewide

DESCRIPTION:

In recent years, the Commonwealth of Massachusetts has been petitioned by vendors of chamber-type leaching structures to reduce the required area for soil absorption when their product is used without aggregate. Regulators at the state level are concerned that the higher loading rates of such a system might reduce the virus removal capability as compared to standard aggregate-laden trenches.

The goal of the proposed project is to determine whether aggregate-free leaching systems challenged with the requested loading rates provide the same degree of pathogen removal as aggregate-laden leaching trenches loaded at the rates prescribed in Title 5.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Design and construction of test systems;
3. Monitoring to document project results; and
4. Technology transfer of results through publication of articles, presentation, and two workshops.

PROJECT COST: $ 39,159

FUNDING: $ 23,359 by the U.S. EPA
$ 15,800 to be determined

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 03-03/319

PROJECT TITLE: South Coastal Inter-Municipal Water Quality Improvement Project
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Pembroke
LOCATION: South Coastal, Taunton Watersheds

DESCRIPTION:

This project is part of a multi-community effort to work collectively in reducing stormwater contaminants from entering 15 303d-listed waterbodies in the towns of Pembroke, Hanover, and Hanson. Pembroke is the lead applicant for this cooperative proposal. In 2001, the towns of Pembroke and Hanson jointly purchased a weed harvester, and in 2000 the same towns jointly applied for and received a CPR grant to install several BMPs for the Indian Head River.

The principal activity of this project will be to purchase and share a Johnston 605 PM-10 vacuum street sweeper to remove roadside sediment, nutrients, toxics, and other pollutants that currently enter stormwater infrastructure. A strategic Pavement Cleaning program will be developed to target the 15 303d-listed waterbodies within the boundaries of the three towns. Storm drain markers, signage, and an intensive public education and outreach program will also be implemented under this proposal.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Purchase and operation of the Johnston 605 PM-10 Vacuum Sweeper;
3. Finalization of an intermunicipal agreement for shared operation of the equipment;
4. Development and implementation of a Pavement Cleaning Program to ensure maximum efficiency of the program;
5. Development and implementation of a public outreach and education program For stakeholders;
6. Water quality monitoring to document project results; and
7. Technology transfer with regard to the effectiveness of the pavement cleaning program.

PROJECT COST: $ 356,910

FUNDING: $ 211,212 by the U.S. EPA
$ 186,000 by the Towns of Pembroke, Hanover, and Hanson

DURATION: 2003 - 2006

MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION

SECTION 319 NPS PROJECT 03-04/319

PROJECT TITLE: Dorothy Pond Perimeter and Local Watershed Stormwater Management/Remediation Proposal
NPS CATEGORY: Urban Runoff
INVESTIGATOR: Town of Millbury
LOCATION: Blackstone Watershed

DESCRIPTION:

Dorothy Pond is an enhanced great pond, approximately 160 acres in size. It is fed by Broadmeadow Brook, with a watershed in the northeast quadrant of Millbury. The Pond is adversely impacted by urban and residential development on the shoreline and in its watershed. Nutrients and sedimentation have caused the Pond to become eutrophic with significant annual growth of nuisance aquatic vegetation. Water quality sampling has demonstrated that nutrient loads and siltation increase significantly during storm events.

The goal of the project is to improve the management of stormwater runoff and thereby reduce the nutrient loading, turbidity, and siltation/sedimentation caused by stormwater entering the Pond. A Diagnostic/Feasibility study and a TMDL analysis for phosphorus have been completed for the Pond, and project activities follow the recommendations of those reports. Tasks include design and installation of twenty Stormceptor-type units to be installed at every storm drain outlet entering Dorothy Pond and other Millbury outlets that empty into Broadmeadow Brook, and outreach/education through activities of the Dorothy Pond Watershed Association, Massachusetts Audubon Society, and others.

Project tasks include:

1. Development of a Quality Assurance Project Plan;
2. Pre- and post-construction water quality monitoring to document project results;
3. Design and installation of twenty Stormceptor or similar units;
4. Development and implementation of a long term operation and maintenance plan to ensure continued effectiveness of the BMPs; and
5. Public outreach and education for watershed stakeholders.

PROJECT COST: $ 189,000

FUNDING: $ 113,400 by the U.S. EPA
$ 75,600 by Town of Millbury

DURATION: 2003 - 2006

APPENDIX
319 NONPOINT SOURCE PROGRAM PROJECTS 1990-1998

90-01/319 **Avon Industrial Park Storm Water Management**
by Old Colony Planning Council

90-02/319 **Milkroom Wastewater Treatment Demonstration**
by Northwest Worcester Co. Conservation Dist.

90-03/319 **Pesticide Handling Demonstration**
by Franklin, Hampden & Hampshire Co. Conservation Districts

90-04/319 **Development of Pesticide Data and Support System for Risk Assessment**
by Worcester County Conservation District

90-05/319 **North and South Rivers Storm Water Mitigation**
by North & South Rivers Watershed Assoc.

91-01/319 **Soil Morphology as an Indicator for Maximum Groundwater Elevation Levels in MA**
by UMass, Amherst, Department of Plan and Soil Sciences

91-02/319 **Rehabilitation and Evaluation of the Sterling Filter Beds at Wachusett Reservoir**
by MDC, Division of Watershed Management

91-03/319 **Soil Bioengineering Streambank Protection Measures on the Blackstone and North Rivers**
by Franklin, Hampden & Hampshire Co. Conservation Districts

91-04/319 **Investigation of Low-Input Cranberry Production**
by UMass, Amherst, Entomology Dept.

91-05/319 **Hydrogeologic Evaluation of the Waquoit Bay Land Margin Ecosystem**
by Cape Cod Commission

92-01/319 **Sprague Cove Storm Water Remediation**
by Town of Marion

92-02/319 **Control of Urban Runoff in the Connecticut, Merrimack and Sudbury River Basins**
by Metropolitan Area Planning Council

92-03/319 **Ipswich River Nonpoint Source Prevention Program**
by MDFWELE, Riverways

92-04/319 **Technical Support for Developing and Implementing Urban Runoff Nonpoint Source Control Strategies in the Merrimack River Basin** by DEP, Division of Water Supply

93-01/319 **Storm Water Remediation for the Broad Marsh River**
by Town of Wareham

93-02/319 **Sediment and Erosion Control in the Taunton River Basin Program**
by MDFWELE, Riverways

93-03/319 **Artificial Recharge Evaluation and Guidance to Municipalities**
by Pioneer Valley Planning Commission

93-04/319 **H_2Ome Check Pilot Project**
by Nashua River Watershed Association

93-05/319 **Commercial Underground Storage Tank Compliance** by Barnstable County Department of Health and the Environment

93-10/319 **Cape Cod Coastal Nonpoint Source Management Plan**
by Cape Cod Commission

93-11/319 **Wachusett Septic System Management System**
by UMass Cooperative Extension, Amherst

93-12/319 **Nitrogen Loading Model Computer Program Development**
by Horsley & Witten, Inc.

93-13/319 **Development and Outreach of an Erosion and Sedimentation Control Guide for Massachusetts** by Franklin, Hampden & Hampshire County Conservation Districts

94-01/319 **Best Management Practices to Control Nonpoint Source Pollution from Forestry Operations** by Berkshire-Pioneer Resource Conservation and Development Area

94-03/319 **Green River Soil Bioengineering Demonstration Project** by Berkshire Conservation District

94-05/319 **Alternative on-Site Septic Systems – Encouraging Their Use in Environmentally Sensitive Areas of Barnstable County** by Barnstable County Dept. of Health and the Environment

94-06/319 **Orleans Storm Water Remediation Project** by Cape Cod Conservation District

94-07/319 **Mill River Nonpoint Source Management Project** by Mass Audubon Society, North Shore

94-08/319 **Lake Tashmoo Storm Water Remediation Project** by Tisbury Waterways, Inc.

94-09/319 **Jones River/Billington Sea Nonpoint Source Pollution Control Project** by Pilgrim Resource Conservation & Development Area Council, Inc.

95-01/319 **Lake Lorraine and Fivemile Pond Nonpoint Source Project** by Pioneer Valley Planning Commission

95-02/319 **A Demonstration Program to Mitigate Storm Drain Pollution Impacting Shellfish Beds** by MA Coastal Zone Management

95-03/319 **Buttermilk Bay Storm Water Remediation Project** by Town of Bourne

95-04/319 **Demonstration of Urban Pollution Control in the Green River Watershed** by Franklin, Hampden and Hampshire Conservation District

95-05/319 **Demonstration of an Alternative On-site Wastewater Disposal System at Allen's Pond Wildlife Sanctuary** by Buzzards Bay Project

95-06/319 **Comprehensive Nonpoint Source Management in the Mill River Subwatershed, Hatfield, MA** by Pioneer Valley Planning Commission

95-07/319 **Title 5 Training for Boards of Health in Five Towns in Barnstable County** by Barnstable County Department of Health and the Environment

95-08/319 **Swan Pond River Storm Water Remediation Project** by Town of Dennis

95-09/319 **Buzzards Bay Action Committee-Holmes Brook Restoration** by Buzzards Bay Action Committee

95-10/319 **Developing and Conducting Training Workshops for the Revised Regulations for MGL C 132, Forest Cutting Practices Act** by Berkshire-Pioneer Resource Conservation and Dev. Area Council

95-11/319 **Neponset River Fishway Project** by MA DEP

96-01/319 **Septic System Management 2000 Project** by Cooperative Extension System, UMass, Amherst

96-02/319 **Monitoring Strategies for Innovative On-site Sewage Disposal Technologies** by UMass, Amherst and Lowell

96-03/319 **Connecticut River Watershed Restoration Project** by Franklin County Commission

96-04/319 **Demonstration of Urban Streambed Stabilization and Wetlands Function and Wildlife Habitat Improvement Using Soil Bioengineering Treatments at Hearthstone Quarry Brook, Chicopee** by City of Chicopee

96-05/319 **Spicket River Watershed Revitalization** by Merrimack River Watershed Council

96-08/319 **Statewide Outreach Course and Tool Kit and Central Massachusetts Partnership Pilot** by Worcester County Conservation Districts

96-09/319 **Sub-Basin Assistance for the SuAsCo and Charles River Watersheds**
DFWELE, Riverways Program

96-10/319 **Watershed Display on NPS Information, Basin Team Newsletter and Resident Survey**
by Berkshire Conservation District

96-11/319 **Watershed Education Teaching (WET) Program**
by UMass Cooperative Extension System, Amherst

97-01/319 **Development of Stormwater Utilities in Two Demonstration Communities: Chicopee & South Hadley**
by Pioneer Valley Planning Commission

97-02/319 **Red Lily Pond Rejuvenation**
by Town of Barnstable

97-03/319 **Technical Outreach to Communities Regarding Alternative On-Site Septic Systems**
by Barnstable County Dept. of Health and the Environment

97-04/319 **Alternative Septic Systems Technologies Workshop Program**
by Berkshire Regional Planning Commission

97-05/319 **Leak Prevention for Heating Oil Storage Systems**
by Barnstable County Dept. of Health and the Environment

97-07/319 **Protecting Nitrogen Sensitive Coastal Embayments Through Land Conservation**
by Buzzards Bay Project

97-08/319 **Hall's Pond Wetlands Restoration Project**
by Town of Brookline

97-09/319 **Three Bay Area - Ropes Beach Subwatershed**
by Town of Barnstable

98-01/319 **Determining the Effectiveness of On-Site Septic Systems for the Removal of Viruses**
by Barnstable County Dept. of Health and the Environment

98-03/319 **Coastal Embayment/Title 5 Training Video**
by Cape Cod Commission

98-05/319 **Nashawannuck Pond Watershed Restoration Project, Easthampton, MA**
by Pioneer Valley Planning Commission

98-06/319 **NPS Pollution Correction in the Farmington River Watershed – Dirt Roads BMP Handbook**
by Berkshire Regional Planning Commission

98-08/319 **Protection of First Herring Brook**
by Town of Scituate

98-09/319 **Manual of Innovative/Alternative On-Site Wastewater Treatment Technologies**
by UMass Amherst

98-11/319 **Development and Demonstration of Protocols for Evaluating Greywater Disposal Systems**
by Massachusetts Department of Environmental Protection

98-12/319 **Demonstrating the Use of Eelgrass Monitoring to Assess Coastal Nonpoint Source Pollution**
by Massachusetts Department of Environmental Protection